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SCIENCE & TECHNOLOGY

USSR: LIFE SCIENCES

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ASSESSMENT OF PRODUCTIVITY OF PUCCINIA GRAMINIS PERS. F. SP. TRITICI ERIKS.
ET E. HENN. ON DETACHED WHEAT LEAVES

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 19, No 5, Sep-Oct 85
(manuscript received 26 Apr 83) pp 419-422

[Article by L. A. Kashemirova and G. G. Filippova, All-Union Scientific
Research Institute of Phytopathology, Moscow Oblast]

[Abstract] Studies aimed at development of a method of analyzing productivity of wheat stem rust pathogen under controlled environmental conditions involved comparison of the sporogenic activity of the pathogen in a benzimidazole culture to its activity on plants grown in pots in the first leaf phase. Krasnozernaya and Mironovskaya 808 varieties were grown in pots and inoculated with freshly-gathered uredospores of the pathogen at the moment of complete unfolding of the first leaf. Cut sections of leaves of these varieties were cultivated on an agarized aqueous medium with addition of benzimidazole (0.004 percent). The number of spores was counted in a Tom-Gorayev chamber. The results were checked by correlation analysis and regression analysis. The peak of sporulation occurred for both varieties on the 13th day after inoculation, as a rule, while the most uredospores produced in 1 day by 1 pustule varied from 9,310-29,880, depending upon the variety involved. Total productivity of 1 pustule of pathogen for the varieties studied was 24,340-56,110. Data obtained were used to compile some regression equations for calculation of productivity of the pathogen according to 3 laboratory indicators. Use of these equations to determine productivity of the wheat stem rust pathogen requires laboratory assessment of a total of 2 or even only 1 indicator of sporogenic activity of the pathogen, which provides significant saving of time and work. Figures 3; references 2: 1 Russian, 1 Western.

2791/9835

CSO: 1840/738

DETERMINATION OF INCIDENCE OF STEM RUST PATHOGEN IN WHEAT PLANTS ACCORDING TO GLUCOSAMINE LEVEL IN THEM

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 19, No 5, Sep-Oct 85
(manuscript received 10 Jul 84) pp 436-439

[Article by A.M. Shabanova, A.M. Umnov and D.I. Chkanikov, All-Union Scientific Research Institute of Phytopathology, Moscow Oblast]

[Abstract] The possibility of determining the degree of contamination of infected wheat plants by the chitin level in them was studied with the use of wheat varieties Kapli and Littl Klab, grown in a greenhouse. Six-day old plants were inoculated with a suspension of uredospores of wheat stem rust (*Puccinia graminis* Pers. f. sp. *tritici* Eriks. et E. Henn.). The chitin level was determined in samples of the first leaves, picked daily from the 1st-10th day after inoculation. Analysis of the chitin level in the infected wheat plants did not reveal the number of fungus mycelia up to the beginning of sporulation but did provide a quantitative assessment of parasite sporulation and possibly possessing long-term resistance to wheat rust disease. Use of the method may help in the search for new fungicides which suppress parasite sporulation but not parasite production. Figure 1; references 9 (Western).

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UDC 581.132

PRIMARY PROCESSES OF PHOTOSYNTHESIS IN DIFFERENT GENOTYPES OF WHEAT

Baku IZVESTIYA AKADEMII NAUK AZERBAJDZHANSKOY SSR, SERIYA BIOLOGICHESKIKH NAUK in Russian No 5, Sep-Oct 86 pp 3-7

[Article by S.E. Raziyeu, N.V. Nizovskaya, G.A. Khramova and D.A. Aliyev, Azerbaijan Scientific Research Institute of Agriculture, Moscow State University imeni M.V. Lomonosov]

[Abstract] An investigation of the functional organization of chloroplasts of shoots of different productivity of wheat varieties, zoned in the AzSSR, involved studies of high-productivity Karakylchik and Azemetli varieties (yield 75-85 centners/hectare) and low-productivity Sarybugda (yield 35-45 centners/hectare). The rate of carbon dioxide fixation and the rate of primary processes of photosynthesis in the varieties studied differed even at the early stages of shoot development. The rate of photo-assimilation of carbon dioxide was twice as high in Karakylchik and Azemetli varieties as that in Sarybugda. The overall levels of chlorophylls a+b in Karakylchik and Azemetli varieties exceeded that in Sarybugda wheat. References 13 (Russian).

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CSO: 1840/774

PHOTOSYNTHETIC PIGMENTS LEVEL ALONG VERTICAL OF SOWINGS IN ONTOGENESIS OF DIFFERENT GENOTYPES OF WHEAT

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR, SERIYA BIOLOGICHESKIKH NAUK in Russian No 5, Sep-Oct 86 pp 101-108

[Article by S.A. Safarov, Azerbaijan Scientific Research Institute of Agriculture]

[Abstract] Dwarf Oviachik wheat, medium-height Kavkaz and Shark wheat and high Sevindzh wheat were used to study the level of photosynthetic pigments, chlorophylls and carotinoids in the leaves and stalks according to their vertical distribution, in sowings of these varieties, differing in phenotypical and genotypical traits. The indicators of the dynamics of the pigments levels in the leaves, stalk and axils of the leaves during vegetation reflected structural and functional features of the photosynthesizing systems of the sowings of the contrasting varieties under different growing conditions as a function of varietal features of the wheat plants. The findings have practical importance in breeding during physiological substantiation of development of a new, high-yield variety with the best architecture of the plants and may be used to create an optimal morphological model of wheat. Figures 5; references 14: 8 Russian, 6 Western.

2791/9835

CSO: 1840/774

CRYOPHYTOPHYSIOLOGICAL MECHANISMS OF ADAPTATION AND RESISTANCE

Kiev FIZIOLOGIYA I BIOKHIMIYA KULTURNYKH RASTENIY in Russian Vol 18, No 6, Nov-Dec 86 pp 555-567

[Article by O.I. Kolosha, Institute of Plant Physiology, UkSSR Academy of Sciences, Kiev]

[Abstract] A multi-year study of adaptation and resistance of plants to low, harmful temperatures is summarized. Studies were carried out at the department of physiology of plant hardiness at the Institute of Plant Physiology, UkSSR. The study, conducted at different levels of organization, examined activity of phytohormones, enzymes, carbohydrate metabolism, structural and functional changes of membranes, their lipid and fatty acid composition and free-radical (non-enzymic) oxidation. Many metabolic processes were studied directly at negative temperatures in non-freezing mixtures. The revealed mechanisms of cryoadaptation and resistance, which includes 5 stages of physiological and biochemical reconstruction, make it possible to control adaptive processes by using cryoprotectors. This will

increase resistance of plants to low temperatures and sudden temperature drops and will increase percentage survival of plants and ensure high productivity. References 27: 20 Russian, 7 Western.

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UDC 633.11"324":58.036.5

CORRELATION BETWEEN FROST-RESISTANCE AND BASIC ECONOMICALLY VALUABLE TRAITS
IN WINTER WHEAT VARIETIES AND HYBRIDS

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 5, May 86
(manuscript received 6 Nov 85) pp 37-41

[Article by I.A. Nurpeisov and R.A. Urazaliyev, Kazakh Scientific Research
Institute of Agriculture imeni V.R. Williams]

[Abstract] A study carried out in Southeastern Kazakhstan showed correlations, in winter wheat varieties and F₁ and F₂ hybrids, between frost resistance, plant height, number of productive stems per plant, length of the main ear, number of spikelets and grains on it, weight of grain from 1 ear, weight of the plant, weight of 1000 grains and length of the vegetation period. The 2-year study involved 30 winter wheat varieties and their F₁ and F₂ hybrids obtained from diallel and topcross crossings. Correlation regression analysis showed a medium to high positive correlation between frost resistance and plant height and length of the vegetation period. There was a negative correlation between frost resistance and weight of the grain per ear. This indicated that the height of plants and length of the vegetation period may be indirect tests for selection of frost-resistant forms. There was a low correlation between frost-resistance and weight of grain from 1 plant, weight of 1000 grains, number of productive stems per plant and number of grains in the main ear, indicating the possibility of the combination of these traits in 1 genotype. The level of correlation between frost-resistance and length of the main ear and also the number of spikelets on it depended upon the variety or hybrid being studied and conditions of the year and varied from a low to a high correlation. References 20: 19 Russian, 1 Western.

2791/9835

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INCREASING RNAase ACTIVITY IN TOMATO LEAVES UNDER EFFECT OF PURPURAGITIZIDE AS DEFENSIVE REACTION OF PLANTS TO TOBACCO MOSAIC VIRUS INFECTION

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 5, May 86
(manuscript received 22 Mar 85) pp 89-91

[Article by I.T. Balashova, T.D. Verderevskaya and P.K. Kintya, Institute of Ecological Genetics, MSSR Academy of Sciences, Kishinev]

[Abstract] The anti-virus effect of steroid glycosides on RNAase activity and resistance of tomato plants to tobacco mosaic virus (TMV) was studied with the use of Teplichnyy 220 tomatoes, a susceptible variety. An aqueous 0.005 percent solution of purpuragitozide was injected into the axil of the first permanent leaf of tomato seedlings and plants were infected mechanically using infectious juice from leaves of tomatoes infected by TMV. The increase of ribonuclease activity in tomato plants after infection by tobacco mosaic virus is one of the defensive reactions to injection of the pathogen and replication of virus RNA and it is accompanied by inhibition of infectiousness of the virus. Purpuragitozide increased RNAase activity and reduced infectiousness of virus in the juice of TMV-infected tomato leaves. Purpuragitozide increased RNAase activity in proportion to the degree of infection. The shorter the time between infection of the plant and use of the preparation, the greater the effectiveness of purpuragitozide. Steroid glycosides may be used to induce plant resistance to virus diseases. References 16: 13 Russian, 3 Western.

2791/9835
CSO: 1840/745

CROSSING OF HETEROPOLOID FORMS OF WINTER RYE

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 31, No 4, Apr 87
(manuscript received 20 Jun 86) pp 368-371

[Article by O.O. Kedrov-Zikhman, T.S. Shilko and A.P. Makarevich, Institute of Genetics and Cytology, BSSR Academy of Sciences]

[Abstract] Continuing studies of the crossing of diploid and tetraploid forms of winter rye were reported concentrating on the setting of underdeveloped nonviable caryopses. Genetically diverse material was used in crossing attempts. All germinated caryopses were analyzed in respect to the number of chromosomes. Most of the viable caryopses were triploid or had maternal number of chromosomes. Underdeveloped caryopses represented a great majority of the product, much higher than the triploid ones. Thus it

was shown that winter rye has a high barrier against crossing forms with different ploidy which prevents formation of triploid grains. On the basis of triploids obtained, the most effective direction of crossing is tetraploidXdiploid; the opposite direction is more effective in crossing underdeveloped caryopses. References 9: 5 Russian, 4 Western.

7813/9835

CSO: 1840/869

BIOPHYSICS

CHEMICAL MODEL OF PHOTOSYNTHESIS

Moscow TASS in Russian 29 Apr 87 0400 GMT

[Text] The Institute of Bioorganic Chemistry of the UkSSR Academy of Sciences has succeeded in chemically modeling photosynthesis.

A TASS correspondent has learned from the Institute's director, Valeriy Kukhar, that scientists have managed to recreate the photosynthesis process outside of plants, where solar energy is accumulated in adenine nucleotide molecules. A special emulsion was used in place of the complex membrane and special enzymes of plant cells. Adenine nucleotide molecules were obtained as a result of highly sophisticated experiments.

Having learned to model these reactions, noted Valeriy Kokhar, it is possible to affect the intensity of photosynthesis and, consequently, to regulate plant development. This opens up prospects for raising the yield of agricultural crops and artificially retarding the growth of weeds.

/9835

CSO: 1840/900--F

HUMAN PHYSICAL FIELDS

Moscow NOVOSTI NAUKI I TEKHNIKI in Russian No 24, 20 Dec 86 pp 1-6

[NOVOSTI report by Grigoriy Lvov, "Human Physical Fields--Fiction and Reality"]

[Text] Several years ago, a group of scientists at the Institute of Radio Engineering and Electronics of the USSR Academy of Sciences, under the direction of Academician Yiriy Gulyayev and Eduard Godik, doctor of physical and mathematical sciences, was engaged in research on fields which occur around biological objects. Here are the initial findings obtained. The scientists spoke about them at a recent scientific session of the Department of General Physics and Astronomy of the USSR Academy of Sciences.

Which fields need to be investigated?

Since the human body consists of the same atoms and molecules as inorganic matter, it ought to be surrounded by the variety of fields known to physics. But the point is to study only those emissions which provide some useful information about the body. For example, X-rays and gamma rays are not of interest from this standpoint; although they can be emitted by living matter, they are merely indicative of individual transmutations of atoms and nuclei, and not of the rate of physiological processes. It is possible that the pattern of a body's gravitational field could reflect the distribution and movement of internal masses, but an accurate recording of such a pattern is not yet within the realm of instrument capabilities. Basically, this means that the problem comes down to the study of electromagnetic fields.

Like any physical body, the human body emits electromagnetic radiation in a spectrum which, according to Planck's Law, is dependent on temperature. At a temperature of 36.6°C, this radiation is most intense in the infrared wavelength band. To be sure, biological tissues absorb it to a marked degree, and it reaches from a depth of not more than 0.1 mm. This means that infrared radiation is governed primarily by blood flow in subcutaneous capillaries and suggests the work of the heat regulation system. It is also possible to record electromagnetic radiation in the decimetric wavelength band. Even though the radiation is less intense in this band, it is absorbed by the body to a less marked degree; it consequently comes from a greater depth and makes estimating the temperature of internal organs possible.

Our body is surrounded by electrical fields. Static charges present on human skin cause them (in part, due to friction against clothing). The motion of these charges, which is related to the work of internal organs and muscles, is manifested in an electrical field change.

Moreover, the occurrence of electrical currents accompanies many processes in the body. The low-frequency magnetic fields which occur given these currents are a source of information about brain-stimulation waves, heart contractions, and nerve impulse propagation. In contrast to electrical fields, slow magnetic fields are barely shielded by biological tissues. This means they can reveal what is happening deep in the body. Magnetic field charts of the heart region (magnetocardiograms), for example, yield very detailed information about the work of the heart muscle.

Finally, visible light is often emitted during some biochemical reactions in living organisms. For this reason, a square centimeter of human skin emits several dozen photons per second. Such weak emissions can only be reliably detected by highly sensitive equipment, so any discussion of an aura illuminating a halo around everyone, which people with extrasensory perception can allegedly see, is better left to the storyteller's imagination.

In addition to electromagnetic emissions, there are two other ways that information is transmitted about a body's vital processes. The first avenue is the noise they emit, whether the vibrations are audible, ultrasonic, or infrasonic. The second way involves changes caused by skin transpiration and breathing in the environmental make-up in the vicinity of the body.

Unusual experiments--unexpected results.

The human organism is much too complex a system to understand by merely analyzing several parameters. The decision was therefore made to create integrated equipment that could measure every field of biological objects and simultaneously record their intrinsic physiological processes. In addition to physicists, those involved in the work included physiologists, biologists, medical workers, and, of course, computer specialists, without whom the "digestion" of such a volume of information would have been unthinkable.

The integrated equipment developed at the Institute of Radio Engineering and Electronics consists of several allied systems. The heat receiving system registers infrared radiation from 16,000 sites on the body surface and transfers temperature values measured to an accuracy of one-hundredth of a degree to the computer's memory at the rate of ten times per second. In themselves, these figures do not say much, since they depend on too many factors; what is important is the dynamics of their change. The computer system therefore isolates sites on the skin's surface where the temperature changes in a particular manner, that is, either uniformly or with some semblance to law. This generally means that a common center governs heat regulation at such sites. The computer can provide something on the order of animated graphics which indicate temperature variation at different sites. It is apparent from such an animation that a person's nostrils cool down upon inhalation

while they heat up upon exhalation; the cheeks, on the other hand, are colder during exhalation than inhalation, and the lips warm up and cool off twice during one "inhalation-exhalation" cycle.

Capacitor antennas capable of detecting a one micron charge displacement on the skin record the pattern of slow electrical fields. A squelch circuit magnetometer with 64 sensing elements measures magnetic fields. The fact that the magnetic field of the human body is a billion times weaker than that of the earth speaks, as nothing else can, to the sensitivity of this device. Conventional protection from interference was insufficient for the experiments. Creating functional protection was necessary; a computer system continually monitors the magnitude of external magnetic fields issuing from natural objects and industrial sources, and special devices compensate for this interference.

A special photon counting unit registers skin luminescence. It was possible to detect a change in luminescence associated with an acceleration or inhibition of biochemical processes. So, luminescence fades if you hold your breath due to the oxygen deficiency which develops; with a breath, it grows intense once again. Finally, equipment was developed which monitors the state of the environment around an object. Thermography, laser spectroscopy, and many other methods are used for this monitoring.

The work of a unique computer-measuring-system yielded intriguing results. First of all, the intensity and spacial propagation of fields occurring around living matter, and in particular, around man, were measured for the first time during conditions of a "clean" scientific experiment. This made it possible to conduct the second, and no less important part of the work--determining a person's sensitivity to fields generated by another human body. It is necessary to simulate the fields of a biological object with instruments during such experiments since it is impossible to rule out mutual psychological influence and other secondary effects during direct contact between two people. Unexpectedly, it turned out that a person is fully capable of detecting changes in someone else's infrared emissions. In fact, there are 10 mv emissions from one square centimeter of the body's surface, while the skin senses variations in heat flow originating externally at a level of 0.3-0.5 mv/cm², which is less by a factor of 20. It is possible that a person is also capable of sensing the slow electrical fields of another body. As for the remaining types of emissions and fields, the transfer of information from one person to another is precluded since their energy is less by a factor of many hundreds and thousands than the threshold of sensitivity to these signals.

Miracles have not come to light.

What is the case for "phenomena?" What is behind the amazing stories about them--clever hoaxes, special abilities, or the gullibility of witnesses? Physicists do not give a direct answer to this question. Such caution is understandable. Historically, there are quite a few cases where even prominent scientists have made mistakes when they tried to pass judgment on matters far from their specialty.

The results of experiments, however, demonstrated that man can, in principle, identify another person's condition by the intensity of several emissions given off by the body. This makes it possible to advance a hypothesis explaining the most widespread stories about certain people's unique abilities. It is well known that there are regions on human skin, the so-called Zakharin-Head zones, which are reflexively linked with internal organs. When there are disorders of internal organs, their corresponding zones acquire an abnormal sensitivity to heat; the infrared radiation of the presented palm can also evoke a response which results in the warming of the zone by several degrees. That such a response not only signals bodily illness but, also, is a means of treatment, cannot be ruled out. At issue is novel, heat massage from a distance, a phenomenon that while undoubtedly unusual is not at all contrary to the laws of nature, and is not, in any case, supernatural. Nevertheless, this is merely a hypothesis which medical workers, rather than physicists, must refute or confirm.

The value of the work conducted by IRE [Institute of Radio Engineering and Electronics] colleagues is of no small account. We have gained new information about the human body. Unique integrated equipment has been created, and measuring techniques have been developed which can be used both for medical and biological research and as a powerful tool for diagnosing and treating many diseases.

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PRODUCTS OF ALKALOID OXIDATION BY BLOOD PLASMA HEMOPROTEIN

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 7, Jul 86 (manuscript received 30 Apr 85) pp 50-51

[Article by N.R. Yelayev and A.V. Ryshakov, Chair of Biological and Inorganic Chemistry (head, N.R. Yelayev, doctor of biological sciences) Petrozavodsk University]

[Abstract] Heme-containing protein (molecular weight of nearly 75000 D), which inactivates alkaloids of the atropine group, was isolated previously and named anti-alkaloid hemoprotein (HP_{aa}). The mechanism of reaction of HP with alkaloids was studied by identifying products of inactivation of atropine and of arecoline, which differs from it in pharmacological action and structure. HP_{aa} inactivated alkaloids by converting them into N-oxides. Figures 2; references 5; 3 Russian, 2 Western.

2791/9835

CSO: 1840/729

BIOLOGICAL PROPERTIES OF GLUTAMINE-(ASPARAGINE)ASE FROM PSEUDOMONAS BOREOPOLIS 526

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 7, Jul 86 (manuscript received 27 Sep 85) pp 71-74

[Article by A.A. Pekhov, V.A. Zanin, A.M. Kozlov, A.Ya. Yurchenko, N.A. Kondratyeva and T.T. Berezov, University of the Friendship of Peoples imeni Patrice Lumumba, All-Union Oncology Research Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Studies in enzymotherapy have shown that enzymes are quite effective anti-tumor agents but they have a narrow spectrum of anti-tumor action and rapid clearance from the blood serum. Their immunogenicity and other negative properties limit their use in oncological practice. The biological (especially the anti-leukemia) properties of glutamine (asparagine)-ase from Ps. boreopolis 526 was studied in experiments on mice. Glutamine-(asparagine)ase from Ps. boreopolis 526 differed immunologically from commercial L-asparaginase preparations. It has a longer half-life (8.5 hours) in mouse serum and produces an anti-tumoral effect on lympholeukemia P-388, in contrast to L-asparaginase preparations. Figures 3; references 14: 3 Russian, 11 Western.

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UDC 620.193.82

MECHANISMS OF BIODEGRADATION OF COPPER BY FUNGI

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian, Vol 125, No 3, Mar 87 (manuscript received 10 Oct 86) pp 633-636

[Article by T.L. Shavlakadze, M.I. Koshoridze, V.N. Rusieshvili, M.A. Tsartsidze and B.A. Lomsadze, Tbilissi State University]

[Abstract] A study is presented of the role of singlet oxygen in biodegradation of copper by mold fungi. The following species were studied: *Aspergillus niger*, *Aspergillus terreus*, and *Paecilomyces varioti*, using a method based on accelerated (24 days) biodegradation of various materials by singlet oxygen generated using bengal red. Biodegradation was judged by electron microscope examination of the copper specimens, indicating that singlet oxygen played a significant role in biodegradation of copper. Inhibition of the biodegradation process by propyl gallate, and antioxidant, confirmed the hypothesis of the significance of oxidation process. All of the mold fungi studied damaged

the copper and caused weight loss, *Aspergillus niger* being the most active, followed by *Aspergillus terreus*. β -carotene also inhibited biodegradation of the copper, by trapping the singlet oxygen to prevent oxidation of the metabolic products of the fungi. Figure 1; references 8: 7 Russian, 1 Western.

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CSO: 1840/872

BOOK ON NO-WASTE AND LOW-WASTE PROCESSES

Moscow KHIMIYA: BEZOTKHODNYYE I MALOOTKHODNYYE PROTSSESY SEGODNYA I ZAVTRA
in Russian No 3, Mar 87 pp 1-2

[Table of contents and annotation from book "No-Waste and Low-Waste Processes
Today and Tomorrow" by Doctor of Chemical Sciences Valentin Alekseyevich
Zaytsev, Znaniye, 32 pages]

[Excerpt] TABLE OF CONTENTS

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ANNOTATION

The development of no-waste technological processes and production at the
present time is becoming a basic strategic direction of the solution of the
problem of environmental protection and efficient use of natural resources.
In the establishment of such productions at different levels, the development
of a common method for the evaluation of their ecological and economic
effectiveness and of the outlook for their adoption in industry is especially
important.

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USSR AND COMECON COUNTRIES COOPERATION IN BIOENGINEERING

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 11, Nov 86, pp 69-71

[Interview with Anatoliy Mikhaylovich Karpov, director of the All-Union Bioengineering Research Institute, and Mikhail Dimitrov, deputy of the general director of the Biotekhnika Combine by EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV correspondent Yuriy Sinyakov under the "In the Head Organizations" rubric: "Cooperative Center: Bioengineering for Biotechnology"; date and place not given; first three paragraphs and fourth paragraph from end in boldface]

[Text] Bioengineering moves biotechnology. Practically on the whole path--from the scientific laboratory to the industrial shop--one cannot manage without complex modern equipment. Scientists working on basic research, experimenters verifying scientific results in practice, and industrial workers converting ideas into final forms are all needed in it.

An arsenal of modern engineering resources is required by this energetically progressing sector of the economy. This includes so-called pilot plants which make use of higher demand. That is the main reason their development has become a project of the collaboration of sister governments!

Our correspondent Yuriy Sinyakov turned to Candidate in Engineering Sciences Anatoliy Karpov, director of the All-Union Bioengineering Research Institute with such a question. This institute has recently been fulfilling the functions of the head organization for the implementation of one of the problems of the Integrated Program of Scientific and Technical Progress of the USSR and Comecon members [KP NTP].

"Before answering your question," proposes A. Karpov, "let us concentrate on the essentials of our work. Only at first glance are the methods which are viable for obtaining microbiological preparations such as drying, evaporation, filtration, purification, and others fully comparable to those which are being used in chemical technology. But this is only an external resemblance. They differ sharply in content.

"Indeed, we are not concerned with chemical substances, but with living microorganisms and with a more complex form of movement of material. Our task

consists of maintaining the substance's new useful properties, for example, by means of genetic engineering, throughout all stages of production of a finished preparation, right up to batch production. This means that independently of production quantities, it is necessary to assure the vital activity of microorganisms.

"Unfortunately, it is not easy to do this. It is impossible, for example, by analogy with chemical technology to mechanically increase the volume of fermenters usable under laboratory conditions for cultivating microorganisms and to bring them up to the dimensions of industrial units. Bioengineering requires finer approaches and more complex calculation formulas.

"Unfortunately, our new sector, biological machine-building, was originally developed according to a traditional system borrowed from chemists: from laboratory facilities to pilot-commercial plants. However, the latter, as I already said, do not make the reproduction of the given properties of microbiological preparations sufficiently precise. It is necessary to extend the experimental stage of the origination of a new preparation for a long period of time in order to base the requirements for industrial equipment on a strictly scientific basis. From five to seven years are necessary for planning, preparation, and placing pilot-commercial plants into operation. And indeed their cost amounts to millions of roubles.

"Meanwhile, there is another, more effective method which enables the introduction of new biotechnological products to be shortened by three to five years. Pilot plants are widely used in world practice. Working in an automated system, they include a variety of fermenters of different functions, but as a rule they are medium in size (larger than laboratory but smaller than industrial). In particular, they make it possible to obtain objective data for planning large-scale industrial lines produce preparations of microbiological synthesis. In spite of the fact that their cost (from several thousand to several hundred thousand rubles) is considerably less than the cost of experimental and pilot-commercial plant equipment, the Soviet Union and other Comecon countries do not have large-scale enterprises producing pilot plants. At the present time, they are manufactured according to individual designs, and therefore in quantities which cannot satisfy existing demands."

"How do you see the solution to this problem?"

"No one has any doubts about the economic expediency of using pilot plants and establishing--in the pilot plant facilities--the industrial production of biologically-active substances. As calculations show, cooperative expenditures of the USSR and Comecon members for this have a magnitude considerably less than that which would be required to purchase experimental equipment in capitalist countries.

"The idea of establishing their own biological machine-building within the framework of Comecon arose in this way: it is proposed that its framework will become a scientific and engineering complex to be organized by interested countries--Comecon members--with the All-Union Bioengineering Research Institute as a base. Such a cooperative center, which we provisionally call

Biotekh, could satisfy the demands of the governments of socialist cooperation for various pilot plants in the very near future.

"According to our plan, Biotekh will be located in two areas--in Moscow and in the city of Groznyy (the capital of the Chechen-Ingush ASSR). Research and design bureaus, laboratory and testing services, experimental and industrial productions, and also subdivisions which provide the service operation of the engineering being done will be included in it.

"Well, finally, and most importantly, biotechnologists and bioengineers from different countries will be able to work together in such a center. They will be engaged in developing pilot plants, and thus with their help, fulfilling the research, design, and planning necessary for further development of industrial equipment, which our countries need."

"When is it proposed to establish Biotekh? How will Comecon member countries participate in this?"

"Biotekh is conceived as a cooperative project. For this purpose, a multilateral agreement will be developed to determine each partner's contribution. It is planned that the interested countries will participate in all stages of the establishment of the scientific-experimental base--design, construction, assembling of equipment, and also supplying several forms of materials and a number of engineering means, including computers.

"According to our calculations, the establishment of a base in Moscow and its affiliated branch in Groznyy must be completed by the end of the current Five-Year Plan so that at the beginning of the next Five-Year Plan it will be possible to start assembly-line production of a large number of automated pilot plants."

"And indeed, will their own plans be required for them? Who will develop them?"

"According to the mutual agreement, the All-Union Bioengineering Research Institute, as the head organization, has unlimited proposals out to the partners for product assortment of engineering means. Many scientific and design collectives of Bulgaria, Hungary, the GDR, Poland, Romania, the Soviet Union, and Czechoslovakia are already conducting their development. Among them are such well-known enterprises and organizations as the Czechoslovak Khepos, the Hungarian Innokord, the Polish Khemoavtomatika, the research institutions of the academies of sciences of the People's Republic of Bulgaria, the GDR, the Socialist Republic of Romania, and also a number of Soviet institutes and enterprises. In some cases they are in charge of plant development, and in others they are working cooperatively.

"In addition, our head organization is charged with the development of another large-scale problem: membrane equipment. It is well-known that engineering is involved in many biotechnological processes. The principle of its action is borrowed from living nature. The membrane, a very thin film enveloping the cell, serves as an excellent filter: it regulates biochemical processes; it lets some substances pass through and holds others back.

"That is the reason why artificial membranes being prepared from different synthetic materials are now widely used in biotechnology for the separation of products on a molecular level. They are used in the preservation of vegetable and fruit juices and the manufacture of high-quality sugar. Through them, a valuable protein product is obtained from waste products of milk production. Approximately half of the membranes to be produced are going to the medical industry -- mainly for the disinfection of biological and medicinal preparations. A characteristic of membrane technologies consists of very low energy expenditures in comparison with other methods. For example, it requires an expenditure of 539 kcal of heat to desalinize a liter of seawater by the usual method, and with membrane technology, it is less by a factor of 10-15.

"This engineering promises an enormous economic effect everywhere. And it is now being developed by the cooperative forces of the USSR and Comecon members. Scientific cooperation is organized at the first stage, in which such large-scale associations as the Bulgarian Farmakhim, the Czechoslovak Liko, institutes and designing bureaus of the Hungarian People's Republic, the GDR, the Polish People's Republic, and the Socialist Republic of Romania are included together with Soviet institutes. After cooperative research and tests, prototypes of membrane engineering will be recommended for assembly-line production. Many of them have been planned to be turned out at the experimental production being built of the affiliated branch of the All-Union Bioengineering Research Institute in Groznyy."

"Anatoliy Mikhaylovich, it has been less than a year since the institute which you manage became the head organization on problems of the KP NTP. How do you evaluate the new form of cooperation? How do you sum up the relations with the partners? What difficulties do you encounter?"

"Actually, the past year in the life of our collective was filled to the limit with big events. It is this and the acceptance of the KP NTP, in which biotechnology occupied a special, high-priority place, and our new international function, and dozens of like-minded friends whom we acquired recently. Great rights and opportunities were granted to us both in the development of advanced engineering and in the organization of mutually beneficial cooperation. And we want to deal with them as efficiently as possible, primarily in the scientific plan.

"This was a year of acquaintances, an exchange of opinions, and a search for judicious, mutually acceptable decisions. Of course, not everything went smoothly. There were disputes and discussions, which sometimes were very long. But they were conducted in the interests of the cause. Indeed, we are working out a single engineering policy. This means someone, including us, must demolish absolute norms and instructions. Most important was that during conversations with colleagues, we succeeded in determining the prospects and ways of meeting our goals.

"The following step, which is also extremely crucial, is now being completed: the conclusion of agreements, pacts, and contracts... Thus, the picture of collaboration takes shape gradually, step by step: who is responsible and for what in research; what forces participate in engineering cooperation; when

cooperative tests will take place, and in what period of time the result should be expected.

"However, life is always more complex than plans, and possibly additional obstacles will arise. But, I am confident, they will be overcome. We want to establish such a united international collective of specialists who will be able to solve any of the most complex tasks.

"And how the other participants have adjusted to cooperative work!" This is what Mikhail Dimitrov, deputy of the general director [Plovdiv, People's Republic of Bulgaria] of the Biotehnika Combine said in a chat with our correspondent:

"Modern biotechnology requires not only the newest knowledge of biology, chemistry, physics, electronics, and cybernetics. It has evoked new directions in the field of machine and instrument building. Our cooperative was formed for this purpose two years ago; it is composed of four plants. We are now constructing their production program taking into account the total strategic goals of the KP NTP.

"We undertook a difficult course: in short periods of time we not only have to overcome a lag in the development of biotechnology, but to be in the vanguard. I do not doubt that it will be considerably easier to reach it by acting jointly and by leaning on the support of partners.

"Up to now we have been at the beginning of a path. Therefore the mechanism of collaboration has still not completely adjusted. Let us say, for us, and also for specialists of other countries, that the problem still exists of establishing quick and effective direct contacts, capable of accelerating decision making -- this would move our whole cause forward more rapidly. There are also unresolved problems, chiefly organizational. However, we are optimistic. Clear goals, the spirit of cooperation, the joint work of all participants of the scientific, engineering, and industrial cooperation of our country are a pledge of successful advancement along the path to establishing biological machine-building -- a new progressive sector of the economy of socialist cooperation."

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COMPUTERS IN BIOTECHNOLOGY

Moscow NAUKA I ZHIZN in Russian No 5, May 87 pp 28-30

[Article by S. Samsonov, candidate of biological sciences]

[Abstract] The Scientific Research Computer Center in Pushchino, Moscow Oblast, was founded in 1972 by academicians G.K. Skryabin and G.M. Frank with the purpose of facilitating mathematical modeling and utilization of computers in biology. One of the areas of application lies in the field of biotechnology, an area of major responsibility of the Institute of Biochemistry and Physiology of Microorganisms. Working together, Skryabin and Frank's institutes have joined in creating software and hardware suitable to processing microorganisms and their products. In addition to large-scale data processing and the creation of data banks (e.g., gene banks), computerized control systems have been devised for continuous monitoring of batch fermenters and chemostats, and in quality control of the final bioproducts. The Center is also actively engaged in cooperative efforts with other biological institutions, particularly the Institute of Molecular Biology. The benefits to be derived from such associations and a multifaceted approach to computerization of fundamental and applied aspects of the biological sciences open up new vistas in the expansion of biotechnology that are hard to imagine even for specialists in the field.

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STATISTICAL PROCESSING OF RESULTS IN AUTOMATED SYSTEM OF RADIATION MONITORING
OF ENVIRONMENT

Moscow GIGIYENA I SANITARIYA in Russian No 5, May 86
(manuscript received 24 Jul 85) pp 51-53

[Article by V.G. Zarkh and S.V. Ostroglyadov, Moscow Scientific Industrial
Association "Radon"]

[Abstract] Methods of statistical processing of accumulated data concerning
radiation monitoring were defined in detail and some results of use of the
methods are presented. A specific algorithm of statistical processing,
realized on an M-6000 mini-computer, is described and discussed. The algorithm
was used to process data of observations for monitoring a radioactive wastes
burial site. Surface water was also monitored. The results were used to re-
distribute points of radiation monitoring of surface waters. The algorithm
is being used by the safety service of the Moscow non-governmental organiza-
tion "Radon" and for processing data of other objects of the environment.
References 3 (Russian).

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CSO: 1840/720

SOME MORPHO-EPIDEMIOLOGICAL FEATURES OF ESOPHAGEAL PATHOLOGY IN HIGH MORBIDITY REGION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 86 pp 45-48

[Article by N.S. Sakhipov, A.A. Zhavoronkov and Kh.S. Kalzhigitov, Pathomorphological Laboratory, Guryev Oblast Oncological Dispensary, Laboratory of Geographic Pathology, Institute of Human Morphology, USSR Academy of Medical Sciences]

[Abstract] Analysis of pathologies of the esophagus (141 cases) due to different diseases and accidents included study of persons in the prenatal period to the age of 19 years (11.3 percent), from 20-39 years (19.9 percent) and from 40-59 years (46.1 percent). The study included males (62.4 percent) and females (37.6 percent), indigenous peoples (37.6 percent), Russians (37.6 percent) and people of other nationalities (13.7 percent). Esophagitis was found in 46.1 percent of the cases and pre-cancer was found in 31.2 percent of the cases, including leukoplakia in 19.9 percent and dysplasia in 11.3 percent of the cases. Pre-cancer occurred more often in males (63.6 percent) than in females (36.4 percent). Esophagitis occurred most frequently in indigenous persons (61.5 percent as compared to 27.7 percent in Russian and 10.8 percent in persons of other nationalities). Study of section material showed that pathological processes in the esophagus of inhabitants of the region with different diseases not connected with esophageal pathology were found in 94.3 percent of the cases. Most frequent among these was chronic esophagitis which predisposed persons to pre-cancer and cancer of the esophagus. Esophageal pathology was diagnosed most frequently in inhabitants of a petroleum processing region. [Although the locale involved here is not identified, the patients are probably served by the Guryev unit. They are largely petroleum-product-related, some farmers and fishermen.]
References 9 (Russian).

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UDC 585.1

REGULATION OF DNA SYNTHESIS IN MACROPHAGES AND CELL HETEROKARYONS
IMMORTALIZED BY ONCOGENES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 294, No 1, May 87
(manuscript received 15 Jan 87) pp 230-232

[Article by R.R. Gumenyuk, I.A. Prudovskiy, L.Z. Topol, P.M. Chumakov and
A.V. Zelenin, Institute of Molecular Biology, USSR Academy of Sciences,
Institute of Carcinogenesis, All Union Oncologic Center, USSR Academy of
Medical Sciences, Moscow]

[Abstract] The goal of this study was to attempt to reactivate DNA synthesis in macrophage nuclei during their fusion with immortalized cells. Cell immortalization by myc, E1A and p53 oncogenes was expressed in their ability to proliferate indefinitely in vitro. Transfection did not lead to malignancy. Analysis of macrophage heterokaryons with cells of starting nontransformed cultures demonstrated absence of both the reactivation of DNA synthesis in the nuclei of macrophages initiated by actively proliferating cells and the retarding effect of macrophages on cell culture nuclei. It was noted that immortalization of diploid cells with oncogenes leads to a one time ability to reactivate DNA synthesis in macrophage nuclei comprising heterokaryons. Thus it was shown that the ability to reactivate DNA synthesis is connected with immortalization phenotype and that this ability is connected with the oncogenes-immortalizers.

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CSO: 1840/866

GENE EXPRESSION OF METHYLOTROPHIC YEAST DIOXYACETONEKINASE HANSENULA
POLYMORPHA IN SACCHAROMYCES CEREVISIAE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 294, No 1, May 87
(manuscript received 8 Dec 86) pp 233-236

[Article by R.N. Ikonomova, L.P. Tikhomirova, I.I. Fodor, L.V. Bystrykh,
L.R. Aminova and Yu.A. Trotsenko, Institute of Biochemistry and Physiology
of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] The goal of this work was to use the gene cloning method for methylotrophic yeasts Hansenula polymorpha to isolate one of the key enzymes for assimilation of methanol, dihydroxyacetonekinase (DAK) and to study expression of this gene in composition of recombinant plasmids. It was shown that gene DAK H polymorpha assures higher level of the synthesis of DAK in H. polymorpha cells as a result of increased number of copies, retaining characteristic properties of inductivity by methanol. Mitotic stability of some plasmid variants is quite high and the recombinant plasmids can be easily isolated from yeast transformants. Introduction of recombinant plasmids into S. cerevisiae facilitates growth of this yeast cell on a medium with DOA. Significant activity of DAK is evident in the transformant extracts indicating that the gene of H. polymorpha DAK may function effectively in heterologous cells of S. cerevisiae. References 10: 2 Russian, 8 Western (2 by Russian authors).

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CSO: 1840/866

UDC 612.017.1.014.46:547.963.3]-08

IN VIVO SUPPRESSION OF IMMUNE RESPONSE TO OVALBUMIN BY ANTI-IDIOTYPE ANTIBODIES

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 7, Jul 86 (manuscript received 20 Sep 85) pp 60-63

[Article by A.S. Grinevich and B.V. Pinegin, Institute of Immunology, USSR
Ministry of Health, Moscow]

[Abstract] Development of methods of inhibiting the immune response with the aid of anti-idiotypic [AID]-antibodies provides a promise of producing new clinical methods of correcting immunogenesis during allergic and auto-immune processes. A study of the conditions of suppression of the immune response to the food allergen ovalbumin with the aid of AID-antibodies used chick ovalbumin [OVA] in experiments in BALB/c and CBA mice (weight 18-20 g). Intraperitoneal injection of 1000 μ kg/mouse of the globulin fraction of AID_{PI}-serum (AID_{PI}-antibody) at different times before immunization suppressed the idiotypic-positive and the overall response to OVA. Maximum effect occurred if AID_{PI}-antibody was injected 12 days before immunization. The AID_{PI}-serum produced was directed against the immunodominant idiotypic. A disaggregated preparation had more pronounced inhibitory effect in relation to IgE synthesis and also in relation to the idiotypic-positive IgG-response. It was assumed that development of suppression depends not on induction in vivo by anti-idiotypic antibodies of suppressor cells but also on the toleration by these antibodies of the lymphoid cells of the corresponding clones. Figures 3; references 15: 3 Russian, 12 Western.

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CSO: 1840/729

TRANSFORMATION AND ULTRA-STRUCTURAL CHANGES OF ERYTHROCYTES AFTER SERUM
PROTEIN SENSITIZATION

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 7, Jul 86 (manuscript received 23 Oct 85) pp 112-114

[Article by V.N. Kidalov and K.K. Zaytseva, Scientific Research Laboratory
of Electron Microscopy and Histochemistry (head K.K. Zaytseva, Doctor of
Medical Sciences), Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] A study of the shapes and ultra-structure of erythrocytes after sensitizing laboratory animals to normal horse serum involved experiments on 40 male Wistar rats (20 experimental and 20 control rats, weight 220±21g). Horse serum, diluted 2-fold by a 0.15 M solution of sodium chloride (volume of 1.8-2.4 ml), was injected under the skin. Sensitization caused quantitative and qualitative changes in internal structure of the erythrocytes as well as changes in leukocytic functional activity and immunocomplex circulation. Poikilocytes, stomatocytes, echinovalocytes and echinostomatocytes and shizocytes were found most frequently among cells with changed form among sensitized rats. Sensitization activated spherulation and partial erythrolysis. Change of form and ultra-structure of the erythrocytes, up to damage and destruction, indicated their participation in the immune response of the rats to antigenic stimulation by allogenic protein as a target-cell. References 9 (Russian).

2791/9835

CSO: 1840/729

UDC 613.6-092.9-07

METHOD OF ASSESSING COMBINED EFFECT OF FACTORS DURING MULTIPLE EXPOSURE OF BODY

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 86
(manuscript received 22 Oct 85) pp 56-59

[Article by R.M. Khvastunov, Moscow Scientific Research Institute of Hygiene imeni F.F. Erisman]

[Abstract] A method of assessing the "force" of the effect on the body involved determination of the magnitude of change of a dependent variable with change of one or more actuating factors. The method permits assessment of both absolute and relative effect of a factor acting alone or in combination by the dependent variable for a specific duration of action or at specific levels of effect and reveals the type of combined effect involved. Questions answered by this "difference method" differ somewhat from questions answered by dispersion analysis and produce a difference in assessment. Two examples of use of the method were presented. Cholinesterase activity was measured in the cerebral cortex of rats subjected to noise higher than 100 decibels and chlorophos in a 1/20 LD dose daily. Cholinesterase suppression was measured in rats during combined effect of chlorophos (inhalation+introduction into the stomach) at three levels of intensity with the dependent variable being the amount of acetylcholine destroyed in the blood plasma. References 3 (Russian).

2791/9835
CSO: 1840/719

UDC 615.5--08:615.832

LASER THERAPY OF SUPPURATION OF POST-OPERATIVE WOUNDS IN LUNG SURGERY

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 86 pp 48-49

[Article by P.R. Chekurov, L.Ts. Ioffe, T.A. Chapala and G.B. Rakishev, Kazakh Scientific Research Institute of Clinical and Experimental Surgery imeni A.N. Syzganov, Alma-Ata]

[Abstract] An LG-75 helium-neon laser with output power of 20 mW was used in complex therapy after operations for treatment of bronchiectasis and lung abscesses. Laser treatment produced much quicker analgesic effect than other methods of treatment; it reduced edema in the perifocal region while producing separation of necrotic masses and active growth of granulations much more quickly than other methods. Laser therapy produced no noticeable dynamics of the hemogram. Sodium ions concentration in the blood serum increased slightly while concentration of potassium and calcium ions was virtually unchanged. The number of microorganisms in the wound discharge decreased significantly and the growth of microflora was slowed. The wounds healed quickly. The results justified the use of laser therapy in treatment of post-operative wounds after lung surgery.

2791/9835

CSO: 1840/741

MORPHOLOGICAL CHANGES OF CILIARY BODY IN TRANSCONJUNCTIVAL SCLERAL COAGULATION
BY ALUMINUM-YTTRIUM-GARNET LASER

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1986 (manuscript received
5 Jun 85) pp 439-441

[Article by N.N. Aleksandrova, aspirant, and P.I. Saprykin, professor,
Chair of Eye Diseases, Saratov Medical Institute]

[Abstract] Adult chinchillas (26, 3-4 kg weight) underwent trans-scleral cyclocoagulation by continuous aluminum-yttrium garnet laser emission (wavelength 1.06 nm). The laser beam was applied parallel to the limbus, 1.0-1.5 mm from it, under local epibulbar anesthesia. Power of emission was 1.5-3.0 W, exposure time 2.0 seconds and diameter of the spot 200 μ m. Laser applications entered the upper half of the limbus along the meridian from 9 to 3 o'clock. Enucleation was performed under 10 percent hexenal narcosis (0.1 g/1.0 kg of body weight), after 1 hour, 24 hours, 7 days and 6 months after laser treatment, and studied histologically. Reactive inflammation in the form of edema and hyperemia occurred in the ciliary body after all laser treatments. Significant disturbance of permeability of the vessels produced accumulation of exudate in the ciliary body, ciliary processes and iris, at the ciliary body/choroid interface and there was significant hemorrhage. The degree of necrosis of the ciliary epithelium and atrophy of the ciliary processes depended directly upon the laser radiation dose. The laser treatment changed the ciliary body more than it changed the conjunctiva and the sclera. References 1 (Western).

2791/9835

CSO: 1840/765

NEW TREATMENT FOR OCULAR HERPES

Moscow NOVOSTI NAUKI I TEKHNIKI in Russian No 24, 20 Dec 86 pp 1-3

[NOVOSTI report]

[Excerpts] Ocular herpes, an infectious eye disease caused by the herpes virus, is one of the most common and insidious eye diseases. In the evening, a person goes to bed thinking he is healthy, and in the morning, he is blind.

An All-Union Center for Ocular Herpes, which coordinates all scientific research on its diagnosis and treatment, has been created under the All-Union Scientific Research Institute for Eye Diseases of the USSR Ministry of Health (Moscow). Professor Arkadiy Kasparov, director of the center, head of the department of reconstructive ophthalmological surgery, and doctor of medical sciences, speaks about it.

We have developed a treatment program for ocular herpes in which prompt surgical treatment and active antiviral therapy are components. It was previously assumed that reconstructive surgery on the cornea, when actively inflamed, was doomed to certain failure. Our experience, however, shows convincingly that comprehensive treatment, including early surgical intervention on the cornea, is not only highly effective in terms of restoring vision, but also reduces considerably, by a factor of two or three, the length of treatment, and consequently, the patients' temporary disability. Incidentally, by this indicator, ocular herpes, occupies one of the first places among various eye diseases.

The operation, which is monitored under a microscope, consists of the painstaking removal by layers (3-5 layers) of the affected sections of the cornea and their subsequent replacement with a donor cornea transplant. The most effective results are obtained when a seamless operation procedure developed in the institute is used; a therapeutic combination of bioglue and soft contact lenses made of neutral materials is applied so implanted corneal sections will not become dislodged. The visual acuity restored when this corneal transplant method is used is better by a factor of 2 1/2 than with traditional treatment.

Of course, such fine reconstructive surgery would be unthinkable without active antiviral therapy before the operation and in the postoperative period.

Reaferon, the genetically engineered analog of interferon developed by Soviet scientists under the direction of Yuriy Ovchinnikov, vice-president of the USSR Academy of Sciences, helped us a great deal. This preparation is much cheaper than interferon and will soon be widely available for broad clinical use. Poludan is another effective antiviral preparation which we developed jointly with colleagues at the Institute of Virology imeni D.I. Ivanovskiy of the USSR Academy of Medical Sciences. It can be administered sub-conjunctivally or even into the eye.

12976/9835

CSO: 1840/458

INSTRUMENT FOR RESTORATION OF FUNCTION IN SHATTERED WRIST

Moscow PRAVDA in Russian 11 Jun 87 p 3

[Article by A. Dmitriyev and N. Malinovskiy]

[Abstract] Anatomical construction of a wrist and its highly varied functions make it difficult to treat successfully even minor injuries. More serious damage leads to long term convalescence with a heavy impact on the labor force. Special apparatus of "cross-bone" fixation was developed for treating wrist injuries. These fixation units are placed on the outside of the fingers or the wrist, fixing and maintaining in proper position the bone fragments and correcting sprains and fractures, reconstituting mobility and the functions of wrists. Evaluation of this apparatus on over 3,000 patients showed this technique to be highly effective, doubling the number of the patients able to return to work. The remaining patients were at least able to take care of their personal needs. This equipment is now mass-produced and exported to the USA, France, Sweden, Iran, Greece, Japan etc.

7813/9835

CSO: 1840/893

ARTIFICIAL LENS IMPLANTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Jun 87 p 3

[Article by V. Volnov]

[Abstract] On the occasion of the implantation of the 1000th artificial lens by B.N. Alekseyev at the All Union Scientific Research Institute of Eye Diseases, an interview was held covering this advance in medicine. Many of the treated patients have better vision than prior to the surgery because the lens has a very high resolution and the individual colors of the spectrum are not damped. Modern attempts to replace eye lenses dates to the work of British surgeon Ridley. Concentrating on the site of implantation, the Soviet workers selected the lens pouch as the natural site of implantation because it has no nerve endings and no vessels which could be damaged. The

surgery requires only a single cut to remove the diseased lens and to insert the implant. The lens contains two elements: two platinum-iridium wires provide the basis and the fastening of the lens; it costs only 17 rubles. The only improvement still to be perfected is the filtration of ultraviolet rays which at this time penetrate through the artificial lens. Soon the lens will be mass produced and then the cataracts will be eradicated totally.

7813/9835

CSO: 1840/895

LEG LENGTHENING OPERATION

Moscow IZVESTIYA in Russian 21 May 87 p 3

[Article by L. Ivchenko, photograph by A. Potapova]

[Abstract] A 7 cm leg lengthening procedure was carried out for 3.5 months on Andrey Lysenko, after his leg had been reimplanted following a car accident in Magadan (Izvestiya, No 34, 1985). The lengthening procedure was carried out by professor O. Oganessian at the Central Scientific Research Institute of Traumatology and Orthopedics in Moscow. The patient himself actively participated in helping the surgeons lengthen his leg at the rate of 1 mm per day by actually turning the adjusting screw on the external fracture fixation device. The extension was well tolerated and did not involve any neural or vascular complications. In view of the success of the procedure, perhaps the first of its kind in the world, the patient is expected to return to complete the course of treatment with another 7 cm of extension. Illustrations 1.

12172/9835

CSO: 1840/890

CRYOPRESERVATION OF ERYTHROCYTES AT MINUS 30°C

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 3, Mar 87
(manuscript received 27 Jan 86) pp 23-27

[Article by N.V. Semenova, S.A. Azovskaya, T.V. Batasheva, V.L. Vinogradov, Yu.S. Sukhanov, doctor of medical sciences, L.I. Fedorova, Dr. med. sci., L.A. Zherebtsov, Dr. med. sci., and M.G. Shitikova, Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow]

[Abstract] A method of cryopreservation of erythrocytes at -30°C uses readily available and economical electric refrigerators, with blood being frozen in glass vials or polymer containers. Use of protective solutions containing a low concentration of glycerin simplified glycerinization and deglycerinization processes and produced a higher yield of intact cells with less expenditures of time and labor. Study of properties of the thawed and washed erythrocytes according to a complex of parameters in vitro and in vivo showed they could be safely stored in the frozen state for up to 24 months without losing viability. Reduction of ATP and potassium concentration in the erythrocytes and an increase in number of hemolysed cells to 14-16 percent required reduction of the length of time of storage of the frozen erythrocytes to 12 months when they are intended for clinical use. Test cells for laboratory studies to identify antibodies may be stored for 24-36 months. References 5: 4 Russian, 1 Western.

2791/9835
CSO: 1840/688

UDC 615.385.1.014.4:[612.111.17+612.118.221.3]

INDIVIDUAL FEATURES OF NATURE OF CHANGE OF RESISTANCE AND HEMOLYSIS OF ERYTHROCYTES DURING BLOOD STORAGE UNDER CONDITIONS OF HYPOTHERMIA AS FUNCTION OF INITIAL HETEROGENEITY OF SUSPENSION

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 3, Mar 87
(manuscript received 7 Feb 86) pp 27-30

[Article by L.K. Stus, V.M. Kuraksa and Yu.S. Sukhanov, doctor of medical sciences, Institute of Problems of Cryobiology and Cryomedicine, UkSSR Academy of Sciences, Kharkov, Central Scientific Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow]

[Abstract] Studies performed on blood samples preserved in Glyugitsur showed the influence of the initial heterogeneity of the suspension on the dynamics of acid resistance of erythrocytes during storage of blood at low temperature. Red blood from different donors displayed different degrees of resistance to

acid hemolytics, suggesting significant variations of the quality of erythrocyte suspensions and of its physical and chemical properties before storage. Studies of donor erythrocytes must include assessment of the initial characteristics of the suspension, especially its initial resistance, for adequate comparison and interpretation of results. Preliminary testing of erythrocytes may be useful at blood transfusion stations in order to predict the keeping capacity of erythrocytes at low temperature by initial values of the mean time of hemolysis of cells in a solution of hydrochloric acid after determining relevant correlations and use of them to establish the periods of safe use of donor blood of different quality. Figures 6; references 8 (Russian).

2791/9835

CSO: 1840/688

UDC 616.151.514-055.5/.7-085.381.015.2:615.38.015.2:615.246.2

AUTOHEMOTRANSFUSIONS AND PLASMAPHERESIS IN COMPLEX TREATMENT OF HEMOPHILIACS

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 3, Mar 87
(manuscript received 12 May 85) pp 47-49

[Article by Z.D. Fedorova, professor, K.Yu. Litmanovich, doctor of medical sciences, L.V. Yegorova, V.D. Kargin, L.P. Papayan, S.D. Volkova and L.M. Fregatova, Leningrad Scientific Research Institute of Hematology and Blood Transfusion]

[Abstract] Transfusion therapy of hemophiliacs results in changes in the liver and spleen, development of hypertension syndrome and thromboembolisms and danger of contracting virus hepatitis. Development of acquired immune deficiency syndrom [AIDS] in hemophiliacs is associated with blood and factor VIII preparations transfusions. In view of the fact that replacement therapy causes such serious complications, hemophilia researchers are studying the possibility of decreasing the volume of blood replacement preparations by increasing the overall hemocoagulation potential of blood by non-specific activation of hemostasis. The studies showed the value of including auto-hemotransfusion and plasmapheresis in complex treatment of hemophilia. Plasmapheresis may be used to treat hemophiliacs as a means of non-specific activation of hemostasis in cases of signs of hemorrhage and during surgery. Use of this method has been effective in reducing the frequency of post-transfusion reaction and complications and requires minimal use of donor blood. Exfusion of 400 ml of blood before tooth extractions and use of hemostatic agents (thrombin, hemophobin, hemostatis sponges) after the extractions in 10 hemophiliacs resulted in slight bleeding from the hole left by extraction in only 2 of the 10 patients. They were given autologous blood. Results of 155 plasmapheresis procedures on 30 hemophiliacs are presented and discussed. One case study is presented. References 5: 3 Russian, 2 Western.

2791/9835

CSO: 1840/688

METHOD OF LONG-TERM STORAGE OF ERYTHROCYTES BY FREEZING AT MODERATELY LOW [-60, -40°C] TEMPERATURES WITH USE OF SOVIET LOW-TEMPERATURE REFRIGERATORS

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 3, Mar 87
(manuscript received 10 Jul 85) pp 50-51

[Article by N.T. Terekhov, M.M. Petrov, doctor of medical sciences,
Yu.A. Ponomarev, M.P. Budennaya, N.V. Timchenko, V.S. Kuts and N.F. Ivchenko,
Kiev Scientific Research Institute of Hematology and Blood Transfusion,
UkSSR Ministry of Health]

[Abstract] The title method proved to be reliable, economical and ensured long-term service of storage refrigerators. Composition of the cryoconservant used was: dimethylsulfoxide-225 g/l (247.5 ml), polyvinylpyrrolidone-150 g/l (mol. wt. 12,600+300), glucose-17 g/l, Na₂HPO₄·12H₂O-5 g/l, KCl-0.45 g/l, water for injection- up to 1 liter, pH of the solution 5.8-5.9 percent. Erythrocytes preserved by this method at -60°C for 12 months and at -40°C for 7 months had the composition: ATP level in the erythrocytes within limits of 3.-3.8 μmoles/g Hb, 2,3-DPG-8.7-12.8 μmoles/g Hb; free hemoglobin concentration in the erythrocyte suspension 0.36-0.87 g/l, protein-cell microaggregates 0-2.6 10¹⁰ /l; number of reduced cells 89-93 percent.

2791/9835
CSO: 1840/688

RADIATION-INDUCED SARCOMAS

Leningrad VOPROSY ONKOLOGII in Russian Vol 32, No 11, Nov 86
(manuscript received 6 Feb 85) pp 79-83

[Article by R.I. Gunko, Yu.T. Neborak, A.S. Krasnov and V.D. Petrik,
Scientific Research Institute of Medical Radiology, USSR Academy of Medical
Sciences, Obninsk]

[Abstract] Clinical-radiological and morphological studies and the medical histories of 6 persons were used in a study of radiation-induced sarcomas in these persons. During radiation therapy, none had signs of lesions in the bones in which secondary tumors were found. Four case histories are described and discussed (the other two had been discussed previously). Patients ranged in age from 22-64 years at time of radiation therapy. Data of this study and that from other authors showed that irradiation in a dose of 60 Gr for 6 weeks at a minimum dose of 30 Gr for 3 weeks is required to induce bone sarcoma. Two patients underwent combined radiation therapy for uterine cancer and one underwent remote gamma-therapy for treatment of dysgerminoma with overall focal doses of 35, 47 and 50 Gr, respectively. Two other patients underwent irradiation in combined therapy for treatment of

breast cancer; the shoulder joint of one was irradiated (54 Gr) and the axillary area of the other was irradiated (30 Gr). The patient with lymphogranulomatosis underwent 2 courses of electron therapy (energy of generation 35 MeV) on the supra-clavicular region in an overall focal dose of 54 Gr. Tumors were located in the pelvic bones of 3 patients and in the shoulder area of the other three. The latent period of development of radiation-induced sarcoma ranged from 10-15 years, with an average of 12 years. Figures 3; references 13: 5 Russian, 8 Western.

2791/9835

CSO: 1840/766

UDC 615.472:615.844].03:616.71-003.93

USE OF ELECTRO-STIMULATION FOR ACTIVIZATION OF BONE KNITTING

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 6, Nov-Dec 86 (manuscript received 9 Oct 85) pp 13-19

[Article by V.K. Kalnberz, Kh.A. Yanson, A.K. Muyzhulis and L.B. Neyman, Latvian Scientific Research Institute of Traumatology and Orthopedics, Riga]

[Abstract] A method of electro-stimulation of reparative osteogenesis in patients with fractures of the long, tubular bones was developed and is being used at the Latvian Research Institute of Traumatology and Orthopedics. The method is used in combination with fixation of the fracture by a Kalnberz external fixation device. The device generates a direct current and cyclic potentials which imitate piezoelectric phenomena of normal bone under a physiological load. Use of the device on 79 patients produced good results in 70 cases. Figures 5; references 28: 16 Russian, 12 Western.

2791/9835

CSO: 1840/769

KARDIOSKRIN-2--AUTOMATED DIALOG SYSTEM FOR GENERAL AND CARDIOLOGICAL SCREENING

Moscow KARDIOLOGIYA in Russian Vol 26, No 11, Nov 86 (manuscript received 28 Oct 85) pp 12-15

[Article by N.A. Andreyev and R.Kh. Erenshiteyn, Latvian Scientific Research Institute of Cardiology, Riga]

[Abstract] An automated system of mass medical screening of the population has been developed in the LaSSR and is being used extensively. The Kardioskrin-2, a dialog system for general screening, reveals cardiovascular and concomitant diseases. Automation of collection of the anamnesis is based on the Iskra-226 computer complex, program and information software. The system uses a syndromal approach to diagnosis with nosological diagnosis being made only on the basis of formulated syndromes. The system differentiates the following cardiovascular diseases: ischemic heart disease, arterial hypertension of different degrees and symptoms, irregular heart rhythm, peripheral vascular diseases and others. Design and operation of the system was described. Dynamic observation of diseases detected is performed by the use of a general purpose software base BISER. It has been used to develop a problem-oriented data-base KARDIS to monitor dispensary care of heart patients. The system provides a promising solution to the problem of optimization of a stepwise approach to general physical examination of the population. The KARDIS data base has been operative at the Riga Polyclinic since 1981 and is now being used in two medical institutes outside of the LaSSR. References 6 (Russian).

2791/9835
CSO: 1840/770

UDC 340.624.1:617-001.45-079.6

DAMAGE TO CLOTHING FROM SHORT-RANGE DISCHARGE FROM SHORT-BARRELED VERSION OF
5.45 MM AKS 74 SUBMACHINE GUN

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 3, Jul-Sep 86
(manuscript received 12 Sep 85) pp 22-24

[Article by V.I. Molchanov, K.N. Kalmykov and L.B. Ozeretskovskiy, Chair of
Forensic Medicine, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] An analysis was conducted on the features of clothing damaged by
short-range discharge from a short-barreled 5.45 MM AKS 74 submachine gun,
equipped with a flash suppressor. When fired from distance of 15-30 cm there
was considerable physical damage to the various types of cloth based on
cotton, and scorching with distances approaching 45 cm. Soot deposits
accumulated from distances of 60 cm, and fine powder grain deposits were
identified with distance of 100-150 cm. References 5 (Russian).

12172/9835
CSO: 1840/1098

NONIONIZING RADIATION EFFECTS

UDC 614.71:613.167+613.647

HYGIENIC RATING OF ELECTROMAGNETIC FIELD WITH CONSIDERATION OF SPECIES
PECULIARITIES OF BODY AND TIME OF EXPOSURE TO FACTOR

Moscow GIGIYENA I SANITARIYA in Russian No 12, Dec 86
(manuscript received 25 Nov 86) pp 15-17

[Article by Yu.D. Dumanskiy, D.S. Ivanov and I.I. Karachev, Kiev Scientific
Research Institute of General and Communal Hygiene imeni A.N. Marzeyev]

[Abstract] A formula to be used to calculate the probability of risk to man of the harmful effect of electromagnetic fields of maximum permissible level in relation to duration of effect and a formula and nomogram for determining the coefficient of calculation of species peculiarities and differences in time of exposure were presented and discussed. The International Commission on Radiological Protection recommends that the probability of harmful effect be calculated on the conditions: 50-100 cases/year/ 10^6 workers involved and a 3-fold less probability for the general public. Results obtained on dogs, rats and mice were converted to analogous data for man by using biologically equivalent time which shows the effect of exposure of animals and the expected effect of exposure of man. An experiment performed on mice exposed for 4 months was described as an example. Figure 1; references 6 (Russian).

2791/9835
CSO: 1840/727

UDC 615.9.015.11.074+613.632-074

CORRELATION BETWEEN TOXICITY INDICATORS AND CHROMATOGRAPHIC CHARACTERISTICS
OF SUBSTANCES

Moscow GIGIYENA I SANITARIYA in Russian No 5, May 86
(manuscript received 9 Oct 85) pp 61-62

[Article by M.S. Yesin and M.S. Vigdergauz, Kuybyshev Oblast Sanitary
Epidemiological Station; Kuybyshev University]

[Abstract] An analysis of relationships between Kovach logarithmic indices and parameters of acute toxicity (Cl₅₀ and LD₅₀) of different classes of organic compounds is described and discussed. A formula for calculating toxicity of the compounds according to Kovach's retention index is proposed. Substances with indices from 966-1000 contained polycyclic aromatic compounds, most of which are carcinogenic. It is shown that a model of biochromatographic processes, occurring upon introduction of poisons into the living body, may be designed by using immobile phases of different chemical nature. Correlations between chromatographic constants and toxicity indicators may be used in prophylactic toxicology to predict the effect of new chemical compounds. Two tables present experimental and calculated LD₅₀ and Cl₅₀ of substances studied. References 8: 6 Russian, 2 Western.

2791/9835
CSO: 1840/720

COMPARATIVE STUDY OF EFFECT OF CONTINUOUS AND INTERMITTENT ACTION OF RICID-II ON ANIMALS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 86
(manuscript received 14 Jan 86) pp 77-79

[Article by L.V. Riza, Lvov Medical Institute]

[Abstract] The effect of continuous and intermittent regimes of action of a new Soviet organophosphorus fungicide, ricid-II, on laboratory animals is described and discussed. White male rats (378) inhaled the fungicide in concentrations of 29.2, 7.2 or 1.8 mg/m³ for 5 days/week for 2 months (continuous regime) or in concentrations of 28.5, 7.0 or 1.9 mg/m³ in the same exposure time (4 hours/day) but only every other week (intermittent regime). Ricid-II in the air was detected by thin-layer chromatography followed by photometry and the effect on the rats was determined after decapitation. The intermittent regimes of inhalation of ricid-II was less dangerous to the rats formmost indicators studied. This was attributed to the relatively long gaps between inhalations and to the fact that only one half as much poison was inhaled. References 12 (Russian).

2791/9835

CSO: 1840/726

COMPUTERIZED DATA PROCESSING IN FORENSIC MEDICINE AND CLINICAL TOXICOLOGY

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 3, Jul-Sep 86
(manuscript received 15 Oct 85) pp 3-8

[Article by V.V. Tomilin, Ye.A. Luzhnikov, V.N. Dagayev, E.E. Gorin, V.I. Merkulov and A.A. Akhundov, Chair of Forensic Medicine, Moscow Medical Stomatological Institute imeni N.A. Semashko; Republic Center for Treatment of Acute Poisoning, Moscow Scientific Research Institute of Emergency Medicine imeni N.V. Sklifosovskiy]

[Abstract] Description is provided of a computerized data base providing information on 841 clinical, laboratory, functional, and morphological parameters derived from 2530 patients with acute intoxication with some of the most common toxicants (acetic acid, dichloroethane, malathion, trichlorofon, pentobarbital, phenobarbital). The data were analyzed by means of BMDP statistical programs, yielding clinically-relevant information for various age groups in relation to blood concentration of the poison. For example, the mortality rate for 41-60 year olds with a blood concentration of 63.1 µg/ml dichloroethane is 95%. Such information is obtained via the computer

dialog diagnostic system OPTEX, providing an easy point of reference for forensic physicians and clinical toxicologists. Figure 1; tables 2.

12172/9835

CSO: 1840/1098

UDC 615.214.32:577.175.829].015.4:615.357.814.1:577.175.829

MECHANISM OF ANTI-DEPRESSANT AND LEARNING STIMULATING EFFECTS OF THYROLIBERIN AND ITS ANALOGS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 7, Jul 86 (manuscript received 19 Apr 85) pp 39-41

[Article by V.V. Zakusov, deceased, R.U. Ostravskaya, M.Yu. Kosoy, T.A. Gudasheva and A.P. Skoldinov, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Derivatives of pyroglutamic acid, without the histidyl-proline fragment and containing gamma-amino butyric acid [GABA] as a second amino acid or beta-alanine were compared with thyroliberin [TL] in their capacity to influence spontaneous or amphetamine-stimulated motor activity in mice and to stimulate elaboration of the conditioned reflex of passive avoidance in rats. Experiments were performed on 18-24 g mice with use of the Optovarimeks multi-channel recorder and on 180-240 g rats in order to determine the capacity of TL to effect elaboration of the passive avoidance reflex. The compounds studied did not stimulate spontaneous motor activity as TL does; the total number of motions decreased and the stimulating effect of phenamine was reduced. This confirmed the importance of the histidyl-proline fragment in the anti-depressant effect of TL. The compounds produced a pronounced increase in learning ability of the experimental rats. The learning stimulating effect of the pyroglutamate derivatives was not potentiated with activation of the motor activity. This showed the selective nature of the effect of the compounds in relation to learning capacity. References 14: 7 Russian, 7 Western.

2791/9835

CSO: 1840/729

STUDY OF MAGNETICALLY CONTROLLED TRANSPORT OF CURARE-LIKE PREPARATIONS
DIADONIUM AND DIPYRONIUM IN EXPERIMENTS ON ANIMALS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,
No 7, Jul 86 (manuscript received 17 Sep 85) pp 48-49

[Article by D.A. Kharkevich, R.N. Alyautdin, V.I. Filippov, A.Yu. Nemirovskiy, S.A. Kasparov and A.A. Kuznetsov, Chair of Pharmacology (head, D.H. Kharkevich), Therapy and Sanitation-Hygiene Faculties, 1st Moscow Medical Institute imeni I.M. Sechenov; Engineering Biophysics Laboratory (head, A.A. Kuznetsov, Candidate of Physico-Mathematical Sciences), Institute of Chemical Physics, USSR Academy of Science, Moscow]

[Abstract] The possibility of creating selective muscle relaxation with the aid of curare-like agents diadonium and dipyronium, contained in magnetically controlled liposomes (ML) with ferrocolloid was studied by performing experiments on cats (weight 2.7-3.5 kg). Intravenous injection of ML containing diadonium (115 micrograms/kg) reduced the amplitude of neuro-muscular potentials in the gastrocnemius muscles of both rear extremities; the magnitude of responses in the extremity placed in the magnetic field decreased by 70 percent as compared to 15 percent in the control. Maximum effect occurred 3 minutes after injection and complete restoration occurred after 9 minutes. Analogous results were obtained after use of dipyronium. The magnetic field itself did not affect neuro-muscular transmission in control experiments. Use of ML for diadonium and dipyronium transport to the cat extremities reduced their negative effect on respiratory muscle function. The experiments confirmed the suitability of the use of ML for directed transport of medicines to a target organ. Figure 1; references 7: 3 Russian, 4 Western.

2791/9835
CSO: 1840/729

STUDY OF MUTAGENIC AND ANTI-MUTAGENIC PROPERTIES OF BEMYTHYL

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 7, Jul 86 (manuscript received 8 Aug 85) pp 76-79

[Article by S.B. Seredenin, Yu.G. Bobkov, A.D. Durnev and O.Yu. Dubovskaya, Scientific Research Laboratory of Pharmacological Genetics (head, S.B. Seredenin, doctor of medical sciences), 2d Moscow Medical Institute imeni N.I. Pirogov, Department of Pharmacology of Adaptation (head, Yu.G. Bobkov, Dr. med. sci.), Scientific Research Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] The search for compounds which modify antimutagenic properties must be carried out among preparations capable not only of preventing or reducing the damaging effect but also of producing a therapeutic effect. Such compounds may include some psychotropic agents, tranquilizers and actoprotectors. In view of this, the effect on the level of spontaneous mutations and those induced by alkylating agents of a new actoprotector, a derivative of 2-mercaptobenzimidazole--bemythyl--was studied and described. The effect of bemythyl in a 10 mg/ml concentration on the level of spontaneous mutation in *Dr. melanogaster* was studied by the Meller-5 method. Changes in mouse cells were assessed by counting dominant lethal mutations after single intraperitoneal injection of bemythyl (180 mg/kg) into 20-22 g CBAXC57BI/6 mice. This produced no mutagenic effects on the level of recessive, age-related lethal mutations in *Dr. melanogaster*. An 180 mg/kg dose did not increase dominant lethal mutations at pre-meiotic or post-meiotic stages of spermatogenesis. A study of bemythyl's cytogenetic activity in vitro and in vivo showed no increase in the number of chromosomal injuries in mouse bone marrow cells nor in human peripheral blood lymphocytes. Bemythyl produced a 2-fold decrease in the level of aberrant cells induced by the alkylating agents fofurin and fopurin. Bemythyl can reduce the genotoxic effect of alkylating agents and can be used in combination with drugs possessing mutagenic activity. References 7 (Russian).

2791/9835

CSO: 1840/729

UDC 615.332

THEORETICAL PRINCIPLES AND WAYS OF PRODUCING NEW ANTIBIOTICS

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 5, May 87 pp 36-49

[Article by S.M. Navashin]

[Abstract] A review is presented of various approaches to new antibiotics. Screening of natural products has run its course. Currently, engineering

enzymology may lead to new discoveries. Antibiotics are not direct translation products; dozens of enzymes and structural genes are involved in their synthesis. In recent years the technique of mutasynthesis was developed in which a mutant is cultivated in a medium with a non-natural analogue of the fragment of antibiotic molecule being synthesized. The review covers general mechanisms of resistance to antibiotics, betalactam antibiotics which represent the greatest discovery in the past 25 years, aminoglycosides, tetracyclines and the use of antibiotics in agricultural applications. Wide use of antibiotics led to saturation of the environment with these reagents and the inevitable appearance of resistance to their action. New approaches to prevent this phenomenon or to counteract it are noted. Figures 3; references 10: 3 Russian (1 by Western authors), 7 Western.

7813/9835
CSO: 1840/874

UDC 547.564.3:577.3

AFFINITY TO BIOLOGICAL MEMBRANES AS INDICATOR OF BIOLOGICAL ACTIVITY OF
2,4-DINITROPHENOL AND ITS ALKYL DERIVATIVES

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR; SERIYA B: GEOLOGICHESKIYE,
KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 87
(manuscript received 2 Sep 86) pp 76-78

[Article by V.D. Lukyanchuk, S.Ye. Mogilevich and B.M. Klebanov, Institute
of Organic Chemistry, UkSSR Academy of Sciences, Kiev]

[Abstract] Results are presented from a study of interrelationships developing upon bonding of dinitrophenol compounds of various chemical structures with cell membranes, using 2,4-dinitrophenol (DNP) and alkyl derivatives of DNP--2,4-dinitro-6-methylphenol (DNOK) and 2,4-dinitro-6-sec-butylphenol (DINOSEB), widely used as chemical synthesis intermediates and universal pesticides. The affinity of the dinitrophenols for erythrocyte membranes was found to be in inverse proportion to their toxicity. A strong negative correlation was found between affinity and toxicity, correlation coefficient $r = -0.99$. Figure 1; references 6: 5 Russian, 1 Western.

6508/9835
CSO: 1840/868

UDC 613.68"344.22"]:612"52"

EFFECT OF NIGHT WATCHES AND INTERMITTENT SLEEP ON STATE OF CIRCADIAN RHYTHMS
OF PHYSIOLOGICAL FUNCTIONS OF FISHERMEN

Moscow GIGIYENA I SANITARIYA in Russian No 12, Dec 86
(manuscript received 30 May 85) pp 76-78

[Article by V.A. Skrupskiy, Scientific Research Institute of Water
Transport, USSR Ministry of Health, Moscow]

[Abstract] A study of 3 groups of 6 fishermen with different watch schedules measured the effect of interrupted sleep and wakefulness on daily rhythms and adaptability of fishermen on a cruise. Group 1 slept through the night without interruption, groups 2 and 3 had intermittent sleep (day and night) and night watch. Average age was 31 ± 0.7 years and average length of sea duty was 5.2 ± 0.8 years. The irregular sleep pattern contributed to disturbances of sleep and to changes of the time pattern of physiological functions. This may reduce the body's adaptability and may lead to disturbances of the circadian rhythm. Work schedules requiring disruptions of sleep should not exceed 90 days in order to avoid desynchronization and disadaptation. Figure 1; references 13: 12 Russian, 1 Western.

2791/9835
CSO; 1840/727

NEUROPHYSIOLOGICAL ANALYSIS OF HYPOTHALAMIC REGULATION MECHANISMS OF PRIMARY SLEEP AND HYPOBIOSIS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 294, No 1, May 87
(manuscript received 4 Nov 86) pp 245-248

[Article by I.G. Karmanova, Ye.A. Aristakesyan and N.V. Shilling, Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, USSR Academy of Sciences, Leningrad]

[Abstract] The role of hypothalamus in regulation of seasonal adjustments of alertness-sleep cycles was studied along with the effect of individual hypothalamus segments on the formation of electric activity of the primordial hippocampus of amphibians. Chronic experiments were performed on 108 frogs using a method for presentation of EEG analysis developed in the laboratory. Total duration of each form of primary sleep depends on the time of the year. EEG data for each season were analyzed showing analogous changes from season to season. Surgical damage to frontal and rear hypothalamus of these frogs showed that in spring the treated animals could not adapt and died; in autumn they all survived. These data have also practical meaning because when sleep and alertness are effected, they assist in understanding the degree of the breakdown of integration system of the human sleep-wakefulness cycle. Figure 1; references 15 (Russian).

813/9835
CSO: 1840/866

SLEEP INDUCED IN CAT BY ELECTRIC STIMULATION OF ACOUSTIC AND MOTOR AREAS IN BRAIN CORTEX

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 125, No 2, Feb 87 (manuscript received 16 May 85) pp 385-388

[Article by D.E. Gelitashvili-Papidze and N.G. Eristavi, Institute of Physiology imeni I.S. Beritashvili, GSSR Academy of Sciences]

[Abstract] Experiments carried out on normal animals showed that repeated stimulation of acoustic and motor areas of the brain cortex led to induction of sleep. Experiments on adult cats under nembutal anesthesia supported this finding. Initial stimulation of these areas resulted in typical orientational reactions to sound, somewhat related to the intensity of the electric stimulus. Repeated stimulations induced sleepy state and eventually sound sleep. Increase in stimuli led to even deeper sleep. An assumption was made that the same mechanism is involved in development of sleep due to

repeated peripheral and direct stimulations. Figure 1; references 4:
3 Russian, 1 Western (by Russian author).

7813/9835
CSO: 1840/871

UDC 612.8+612.8.015

INFLUENCE OF GENERAL VERTICAL VIBRATION ON RELATIONSHIPS BETWEEN MEDIATORS
IN VARIOUS SEGMENTS OF BRAIN

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 31, No 6, Jun 87
(manuscript received 8 Sep 86) pp 567-570

[Article by Academician A.S. Dmitriyev, Belorussian Academy of Sciences,
M.Yu. Tayts, T.V. Dudina and T.S. Kandybo, Institute of Physiology,
Belorussian Academy of Sciences]

[Abstract] A study was performed of the activity of the central neuromediator systems involved in the response reaction to extreme influences. Reception of corticosterone by various brain structures was studied, reflecting the reaction of the central nervous system to changes in the functional status of the hypothalamus-hypophysis-adrenocortical system. The work was performed on adult male Wistar rats following 2 hours general vertical vibration at 10 Hz, amplitude 1 mm, acceleration 2 m/s². The decrease in excitability of zones of the cortex and weakening of activation reaction in response to afferent signals are associated with the activation of the noradrenaline- and serotonergic systems. In the parietal cortex, significant changes occur in the reception of corticosterone, reflecting the variation in the choline-, monoamine- and GABAergic neuronal activity with level of glucocorticoids in the body and the functional status of the hypothalamus-hypophysis-adrenocortical system. Figure 1; references 15: 11 Russian, 4 Western.

6508/9835
CSO: 1840/870

SOVIET MINISTER OF HEALTH CHAZOV ON HEALTH SYSTEM RESTRUCTURING

Leningrad LENINGRADSKAYA PRAVDA in Russian 24 Apr 87 p 3

[Statement by USSR Minister of Health Academician Ye. I. Chazov on Restructuring Medical Services System in Leningrad under the rubric: "At the Turning Point"; recorded by LENINGRADSKAYA PRAVDA correspondent T. Chesanova]

[Text] Quite a lot has been recently said and written about shortcomings in the Soviet public health system. Our medical sector has in fact been performing at a low level of proficiency that does not measure up to global standards nor to the position occupied by our country. This can no longer be tolerated either by the party, or the government, or the entire nation.

I shall not dwell on the overall shortcomings of public health. Quite a bit has also been said about that already. I do want to point out that many of the principles underlying the organization, planning, and financing of public health services have not changed from the way they evolved many years ago. At a certain stage they were progressive. Later, however, they led to a pursuit for quantity to the detriment of quality with the result that very little money was being allocated for the health sector, and there was a shortage of funds for both drugs and equipment. That is why restructuring in the health sector is not only necessary but essential.

This is not a one-day undertaking, or even a one-year project. Rather, it seems to us that such restructuring will require a minimum of two Five-Year Plans. And where do we think we should start? We came here to Leningrad with RSFSR Minister of Health Anatoliy Ivanovich Potapov for the purpose of discussing problems concerned with the restructuring of public health operations in Leningrad which we hope will set the standard for the entire country.

What is the present situation? Unfortunately, it is far from optimal. For example, the indices for emergency surgery performance in Leningrad is worse than the average for the Russian Federation. Why? Because the polyclinics, the first link in the system, are doing a poor job of diagnostics, and patients enter the hospitals in a neglected state. Infant mortality is also high in Leningrad. Why? Because there are too many premature births which, as we know, increases the mortality rate twenty-fold. This is indicative of major shortcomings in maternity and child care services, and primarily in the

first line link of those services. In addition, of the 24 obstetric hospitals in the city only seven are housed in standard buildings. It is a shame to say that two maternity homes that were built during the 11th Five-Year Plan had to be closed for capital repairs shortly after they were opened.

It seems to me that the main link that requires active improvement today is the primary territorial uchastok service. Therefore, we ourselves propose, and support the suggestions of Leningrad health specialists that the outpatient and polyclinic institutions be experimentally placed under a new system of financing.

The supervisor of a polyclinic institution will now be in charge of credit allocations. He will have available to him a rather large number of incentives to affect qualitative indices. The evaluation of a uchastok physician's work will not be made on the basis of the number of patients he receives during a given shift, but rather by the state of their health -- by the number of disability lists, illnesses, complications, repeated hospitalization, and by complaints... The physician who works well will receive a rather substantial pay supplement.

We assume that this experiment in Leningrad will begin January 1, 1988. It will not only require an organizational and financial restructuring, but a psychological restructuring of the medical worker as well. I think that such restructuring will even offend some people and that all will take to the new system freely and easily because it will demand a new quality of performance and greater responsibility.

Of course, in addition to being conscientious about the quality of his work, a physician must have the opportunity of giving proper attention to the persons under his care. The Ministry is currently reviewing all existing instructions and orders in order to relieve the physician of unnecessary paper work and allow him freedom of action in the medical sense, but not turn him into a robot that acts upon instructions.

We support the idea that a great part of diagnostic work should be done during the pre-hospital period, and for that purpose we are planning to build new diagnostic centers. The first such center in Leningrad will open in 1988. That center will have a full complement of the latest medical equipment which includes two computer tomographs, two biochemical analyzers, 20 gastrofibroscopes, and 10 ultrasound machines. Eight echocardiograph machines will be installed in a special functional diagnostics department for examining cardiovascular patients. Operating on a two to three shift schedule, the center will be able to handle up to 900 persons daily. One year later we shall build another diagnostic center in Leningrad. All of this will make it possible to shift the performance of most examinations at the highest level to the polyclinics whereas the hospitals will be principally engaged in the treatment and diagnosis of the most difficult and complicated cases.

Much is expected of medical science which is also in need of restructuring since it is not yet satisfying the requirements of practical public health. Even the major scientific centers today are not reporting about what has been done in the way of new theories, drugs, and equipment, but rather various

instructions and methodological guides. That does not correspond to the level of contemporary science.

Within the Ministry today there are 99 third category institutes with a scientific staff of less than 50 persons. What can one expect from such institutes? Nothing. They have been organized only because of the arrogance of local leaders and we are now seriously considering the question of closing them down. After all, we know that 45 million rubles are spent annually on those 99 institutes. Our task is to put those funds to real use so that we can build genuinely major scientific centers capable of resolving the vital problems confronted in the practice of public health.

The restructuring of medical science is essential in Leningrad too. Take heart surgery. Today this is the most backward area of medicine in our country. A total of 800 coronary bypass operations are performed in our country every year. But in France, not to mention the USA, 22,000 such operations are performed annually. And yet we know that at one time Leningrad was the cradle of heart surgery. It was here where such brilliant scientists and clinicists as Kupriyanov and Kolesov worked. And if today we do not have sufficient facilities in Leningrad to perform congenital heart disease operations, we are all to blame -- the ministries of the USSR, the Russian Federation, and the Leningrad Public Health sector.

I could name some other areas where we are behind, such as transplants. We must organize a kidney transplant center and a major heart surgery center. One cannot believe that there would not be young talented surgeons who could take this matter in hand. It is most desirable that Leningrad renew its former fame as a major medical center.

The principal strategic problem for medicine is the availability of equipment. The situation in this area must be corrected immediately. What is being done about it? The Ministry is currently considering the manufacture of fibroscopes at a branch of the Leningrad Optical Instrument Association [LOMO] in conjunction with a Japanese firm. The production of a new artificial kidney is slated to begin next year.

The first one thousand improved electrocardiograph machines with microprocessors will be produced this year. We are now considering the manufacture of computerized tomography machines in conjunction with an English firm.

No less an important question is how this equipment will be used, since the diagnostic equipment we have presently is far from being fully utilized. This depends entirely on us. We hope that the restructuring that will take place in Leningrad will compel specialists to keep a record of every hour that the very complex diagnostic equipment is in operation.

We are also being helped by the All-Union Central Council of Trade Unions. We have reached an agreement whereby the funds saved from the reduction of temporary disability will be allocated to the public health sector. Even now Leningrad will receive an additional 3.5 million rubles for the purchase of medicines, x-ray films and all items for which there is currently the greatest

need. An additional 20,000 places will be made available at the trade union sanatoriums for patient rehabilitation. Those places will be available to persons who are not just cardiovascular patients as had been the case previously. For example, persons sent there will include serious post-op patients.

In speaking about other sources of financing, one must not forget the industrial associations. We have become acquainted with the medical and hygiene unit of the Kirovskiy Zavod association, and one wishes that there were only more such "health workshops" in Leningrad. The task of setting up such units should be viewed in this way: If an enterprise has 5,000 workers and office employees, it should have its own treatment center and sanatorium. If it has from eight to ten thousand workers, then it should have its own medical-sanitation unit. Then the enterprises would be rendering a great assistance to the Soviet health sector.

As we all know quite well, health does not at all depend solely upon the medical profession. And although medical personnel have the greatest interest in that factor, for a long time the field of medicine, for example, never got into problems of ecology. A recent session of the CPSU Central Committee Politburo urgently raised the issue of a clean environment because this problem is far from being an innocuous one. I have already mentioned premature births. Medics know that they occur most often in women who work in certain sectors: paint and varnish, industrial rubber plants, and others. And, as a rule, industrial safety questions are not given first priority.

The Ministry of Health will be giving very serious attention to ecological and hygiene problems. You know that the paper and pulp plant at Priozersk was recently closed. A resolution is now being prepared for the Kirish plants that demands that the installation of the sewage treatment facilities be completed before July 1. Otherwise, after having closed production at the Kirish plants by 20 percent, production will be cut by another 30 percent.

By not exercising sufficient persistence and energy in these problems, and at times attempting to avoid them altogether, the medical sector has resembled some kind of repair service. But it must oversee all the links in the health chain, and doctoring should only play a small part there. We are prepared to support all measures that would stimulate people to be more concerned about their health. And vice versa. For example, currently under consideration is a rise in the cost of tobacco in which case the increased revenue would be transferred to the health sector. In other words, we are treating and trying to undo the consequences of smoking, so why should only the state have to pay for this?

And finally, one more thing that is perhaps the most painful of our problems -- medical education. Where are we getting bad physicians? As before, the VUZs are graduating a very large percentage of specialists who are not prepared for work and who cannot perform operations independently, who cannot deliver babies, or who cannot read EKGs...These kinds of physicians we don't need.

Beginning with the new academic year, we are planning to start a new method of training students as called for in the CPSU Central Committee decree on higher education. Programs are being reviewed and a system of social demands is being introduced whereby "narrow" specialists will be trained in accord with requests from local health authorities. A diploma will be issued after the seventh year when the graduate is able to give an account of his practical work. Insufficiently qualified graduates will be granted a paramedic's certificate instead of a physician's diploma.

In conclusion, I should like to say that Leningrad was not randomly selected to be the "beacon" of restructuring in the health sector. Along with several other cities of the Russian Federation and one of the republics, it will be the first to transfer to new forms of financing, planning, and administration. We want more independence to be exercised locally, and we believe that genuine initiative will be manifested in the city on the Neva. We know the Leningrad physicians, scientists, and health administrators, and we know of their serious approach to the matter at hand, their sincere interest, and desire to raise medical services to a qualitatively new level. Surely, we know that restructuring not only means better leadership and assistance from the Ministry, but that it primarily means more intensified efforts on the part of each one of us and each medical worker.

6289

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UDC 614.7(574)

ORGANIZATION OF SYSTEM OF MONITORING ENVIRONMENTAL QUALITY AND STATE OF
HEALTH OF KAZAKHSTAN INHABITANTS

Moscow GIGIYENA I SANITARIYA in Russian No 5, May 86
(manuscript received 5 Dec 85) pp 21-24

[Article by M.Ye. Kulmanov, Republic Scientific and Practical Center for
Hygiene Environmental Problems, Alma-Ata]

[Abstract] A special-purpose program "Principles of Formation and Effect
of Environmental Factors on Public Health", developed at the Alma-Ata
Republic Scientific and Practical Center on Problems of Hygiene of the
Environment, is described and discussed. Major tasks of the center include
organization and coordination of problems involving analysis of the degree
of environmental pollution in different regions of Kazakhstan, study of toxic
substances and their danger levels, development of safe environmental criteria
and study of medical problems. The center gathers data concerning rates of
seeking medical assistance and the effects of delay in seeking medical advice.
The findings are being used to construct a model for predicting changes of
the environment and of the state of health of peoples of this region in the
near future and up to the year 2000. References 5 (Russian).

2791/9835
CSO: 1840/720

PHYSICAL DEVELOPMENT OF CHILDREN AND ADOLESCENTS OF DIFFERENT NATIONALITIES
OF USSR

Moscow GIGIYENA I SANITARIYA in Russian No 5, May 86 (manuscript received
10 Jul 85) pp 44-47

[Article by B.N. Ilyin, Leningrad Scientific Research Institute of Radiation
Hygiene, RSFSR Ministry of Health]

[Abstract] The effect of national origin on the physical development of
children and adolescents is discussed. The role of the economic status of
the family, climatic conditions, nutrition and ethnic factors in their
development is discussed. No dependences between physical development and
ethnic background were found for children of the USSR. Presence or absence
of some trace elements in food and water in some regions affects child
physical development and causes some childhood diseases. National (ethnic)
background does not determine features of physical development of USSR
children nor does it affect their health. The role of ethnic background in
affecting physical development stems from a complex of social and economic
factors and not from hereditary factors of the nation. Equalizing social
and economic differences will help to equalize physical development and
healthfulness of children of different nations and regions. References 27:
21 Russian, 6 Western.

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CSO: 1840/720

SOCIAL VIEWPOINTS AND ATTITUDE TOWARDS CANCER PATIENTS

Leningrad VOPROSY ONKOLOGII in Russian Vol 32, No 11, Nov 86
(manuscript received 13 Jan 86) pp 50-55

[Article by V.N. Gerasimenko, A.Sh. Tkhostov and N.G. Koshchug, All-Union
Oncological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study of social attitudes concerning cancer and cancer
patients and of willingness to be in social contact with former cancer
patients is described and discussed. Workers and employees of industrial
enterprises (250) and medical workers (50) in the middle and higher echelon
of a cancer clinic responded anonymously to a questionnaire used to measure
these attitudes. Nearly 13 percent of the medical personnel and 20 percent
of the workers and employees considered cancer to be an infectious disease.
Four percent of the medical personnel and 22 percent of the workers and
employees said that cancer is untreatable while 91 percent and 70 percent,
respectively, said that some forms of cancer, but not all forms, are

treatable. Twenty five percent believed in positive effect of cancer prevention measures while 75 percent of those who believed such measures were ineffective did so because they believed that prophylaxis is possible only in cases involving infectious diseases. Such beliefs determined the respondents' attitude toward former cancer patients. Results of the survey helped in attempts to orient cancer patients in dealing with their disease. References 4 (Russian).

2791/9835
CSO: 1840/766

UDC 615.471.03:616-084.3-053.6]-65.011.56

AUTOMATED INFORMATION SYSTEM IN MEDICAL SCREENING--DISPENSARIZATION--OF JUVENILES

Moscow SOVETSKAYA MEDITSINA in Russian No 12, Dec 86 (manuscript received 25 Dec 85) pp 80-84

[Article by A.A. Zaborskis, A.Yu. Nesovene, A.I. Akstinene, A.A. Shachkute, L.Yu. Shumskas and I.S. Nedzelskene, Scientific Research Institute of Physiology and Pathology of the Cardiovascular System; Central Scientific Research Laboratory, Kaunas Medical Institute; Clinical Hospital No 3 (chief physician R.F. Dumchyus) and Central Hospital (chief physician T.A. Snechkus), Kaunas]

[Abstract] A progress report describes an automatic information system to be used to process data of prophylactic examinations of youths. The system is being developed at Kaunas Medical Institute in order to improve medical screening of youths and to carry out medical measures performed at laboratories of health protection of children and youth of the Central Scientific Research Laboratory of Kaunas Medical Institute and laboratories of epidemiological research of the Scientific Research Institute of the Physiology and Pathology of the Cardiovascular system. Work is underway at the central polyclinic of Kaunas clinical hospital No. 3 and the rayon Kayshyadoris polyclinic in LitSSR. Computer software is being developed at the Kaunas Medical Institute YES-1022 computer complex. The system will be an important link in development of an integrated program of primary prevention of chronic infectious diseases. Methodological bases of the system were described and discussed. They include: collection of primary information, standardization of methods of information collection and construction of a data bank. Use of the system in prevention of chronic non-infectious diseases and selection of youths for active screening were described. References 12: 10 Russian, 2 Western.

2791/9835
CSO: 1840/768

METHODS OF EFFECTIVE USE OF LABORATORY INDICATORS DURING MASS PHYSICAL EXAMINATIONS--DISPENSARIZATION

Moscow LABORATORNOYE DELO in Russian No 6, Jun 86 (manuscript received 27 Jun 85) pp 371-374

[Article by Yu.I. Tkach, Chair of Clinical Laboratory Diagnostics, Ukrainian Institute for Advanced Training of Physicians, USSR Ministry of Health, Kharkov]

[Abstract] A method of early detection of diseases during mass physical examinations was described and discussed. The method involves determination of 5 indicators in the blood and 2 in the urine by use of laboratory tests. The leukocyte count, erythrocyte count, sedimentation rate, hemoglobin level and glucose level in the blood and the glucose level and protein level in the urine were determined and compared with normal laboratory findings for these indicators for the region. Pre-morbid conditions and incipient diseases were detected by comparison with normal values of laboratory indicators in a very narrow range and with previous medical findings for a given individual. References 8 (Russian).

2791/9835
CSO: 1840/765

PROMOTION OF HEALTHY LIFE-STYLE--ONE PROBLEM IN SUCCESSFUL MEDICAL CARE OF CHILDREN

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 86 pp 27-28

[Article by S.A. Gagarina, K.Ye. Batyrkhanova, K.Kh. Zhunusova and S.K. Pugach, Kazakh Scientific Research Institute of Pediatrics, Alma-Ata]

[Abstract] Prophylactic work at children's medical institutions emphasizes prevention of somatic, infectious and psycho-neurotic diseases, provision of a healthy environment and early detection of morbid and pre-morbid states. All of this is based on development of a healthy life-style. Anonymous questionnaires were used to measure the level of competence of parents in recognizing and providing an appropriate life-style. Answers showed that only 19.4 percent of the respondents (from 150 questionnaires) attended lectures or talks concerning health care for children in the first 3 years of life. Most persons preferred to receive health care information via radio or TV. Only half of the respondents showed proper knowledge of nutrition and diet. Only 16.1 percent knew what toys are needed for proper child development. Dissemination of information and propaganda was recommended to improve this situation.

2791/9835
CSO: 1840/741

DETECTION BY RESEARCH EXPEDITION OF NON-SPECIFIC EYE DISEASES IN ADULTS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 86 pp 30-31

[Article by G.K. Kaliyeva, Kazakh Scientific Research Institute of Tuberculosis, Alma-Ata]

[Abstract] The staff of the medical expedition to detect pulmonary and extra-pulmonary tuberculosis among people in the Kurtinsk Rayon of the KazSSR included an ophthalmologist, for the first time, in 1984. Eye examinations were performed on 1055 persons (age 17 years or older). Examinations included a check of visual acuity, intra-ocular pressure and ophthalmological studies of the anterior and posterior sections of the eyeball. Correction of anomalous refraction was performed after the examinations. Types and percents of eye diseases were listed in a percent relationship. Non-specific changes of the eye were found in 617 persons (34 percent of those examined).

2791/9835
CSO: 1840/741

NEW ECONOMIC MANAGEMENT METHODS IN MEDICAL CENTERS

Moscow EKONOMICHESKAYA GAZETA in Russian No 20, May 87 p 14

[Article by S.N. Fedorov and N. Yakovchuk]

[Abstract] A novel approach, for the Soviet Union, was tried in the Eye Microsurgery Center headed by S.N. Fedorov: administration based on economic principle. The state provides the budget for treatment of patients. The total sum is then distributed to various services and an average value is assigned to these services or operations. By improving their techniques or increasing the case load while decreasing poor performance, the collective can save money which then can be used for the benefit of the group: purchase of new equipment, various social amenities and even cash bonuses. No pay is provided for poor operations requiring repeat interventions. A pilot plant which normally was used for production of glass frames expanded its activities to other products: diamond knives, electronic equipment, etc. Selling these products provides additional currency which then permits direct purchases. These profits made it possible to even provide food to patients, medical personnel etc. Overall, the entire psychology of the working cadres was altered evoking hidden reserves of motivated human drive.

7813/9835
CSO: 1840/898

DRUG SHORTAGES IN UZBEKISTAN

Tashkent PRAVDA VOSTOKA in Russian 26 Mar 87 p 3

[Article by V. Petrunek, Section Chief of Public Health and Social Security KNC USSR and O. Lukyanchikov, special correspondent]

[Abstract] A number of abuses were recounted concerning drug supply: nursing staff hoarding drugs so that they could dole it out to select patients and doctors, doctors misappropriating narcotics to sell them to drug addicts, other doctors prescribing only a single drug because they are unaware of any other being just as effective, drugs being shipped repeatedly to hospitals where there is no need for them, while the neighboring ones cannot get any, loss of grain alcohol to black marketeers, lack of communication between hospitals in a community etc. Reviewing these abuses led to firing of 22 medical staff personnel, disciplinary actions against 110 workers at various hospitals and 8 pending court cases. Corrections are under way: over 100 different drugs are to be distributed in these hospitals at a cost of over 650,000 rubles. But the answer to the problem must be in everyday attention to supply of drugs for the needy patients.

7813/9835

CSO: 1840/897

DRUG ADDICTION AND REHABILITATION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Jun 87 p 4

[Article by Ye. Kolesnikova, correspondent, Moscow]

[Abstract] A visit to the No 17 Substance-Abuse Hospital in Moscow shows the full tragedy of substance abuse in the faces of the dispirited victims who have found themselves at the hospital. Basically, it was a desire to 'fit in' with their friends that led them to taking the first steps down the road to disaster, and weakness prevented them from turning away from bad habits. More often than not this led to crime and breakdown of family structures. According to V. Nazarov, head of the substance abuse department at the hospital, only ten out a hundred abusers can be treated successfully. Recent statistics have revealed the scope of the problem: there are 123,000 drug users and 46,000 drug addicts. In the latter category 14,000 are juveniles. Most of the addicts are 30 to 40 years of age and spend from 1,000 to 3,000 rubles per month on drugs. Equally frightening is the fact that some 40,000 crimes a year are committed because of drugs.

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ATHEROSCLEROSIS SCREENING PROGRAM

Moscow TRUD in Russian 13 May 87 p 4

[Interview with Yu. Lopukhin, academician, Institute of Physicochemical Medicine, conducted by V. Belitskiy]

[Abstract] With the realization that cholesterol is the key factor determining the incidence of atherosclerosis in the population, and the fact that atherosclerosis accounts for 50% of the deaths in the 35-55 years age group, special measures are being taken to lower blood cholesterol levels in the groups at risk. These measures include dietary modification as well as medical means. A reduction in blood cholesterol of 25% has been shown to be accompanied by a 50% decrease in the incidence of cardiovascular disease. However, prevention is generally accepted as the optimum means of avoiding atherosclerosis. Trials with a screening program at the Vladimir Tractor Plant have revealed elevated blood cholesterol levels in 40% of the 500 workers so tested. On the basis of these preliminary studies, it appears that a general screening program applicable to the entire country should encompass the group most at risk, i.e., those in the 35-55 years age bracket. This would significantly reduce expenditures for blood analysis and the time needed to screen a larger population group. On the basis of the results the 35-55 population would be divided into a healthy category, a low risk category, and a high risk category requiring immediate medical attention.

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EXTREME STATES IN FORENSIC PSYCHIATRY

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 3, Jul-Sep 86
(manuscript received 16 Aug 85) pp 43-46

[Article by T.P. Pechernikova and M.S. Dobrogayeva, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V.P. Serbskiy, USSR Ministry of Health, Moscow]

[Abstract] An analysis of extreme states in 261 patients over a 30 year period (1955-1984) with both exogenous (alcoholic) and psychogenic components demonstrated two basic types of disorders. In one type, twilight-type disorders of consciousness were apparent (with alcoholic or other exogenous components, or psychogenic), whereas, in the other type, consciousness was unaffected (acute paranoia, acute depressions). These observations indicate that while there may be an underlying common pathogenetic mechanism responsible for such states, there also appears to be a nonspecific component in the patient's response to social and other types of stress. References 13 (Russian).

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OPTIMAL CONCENTRATION LIMITS FOR CHLORELLA CULTIVATION

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA FIZIKO-TEKHNICHESKIKH, KHIMICHESKIKH I GEOLOGICHESKIKH NAUK in Russian No 2, Mar-Apr 87 (manuscript received 1 Feb 85) pp 100-101

[Article by Sh.R. Redzhepova, Turkmen Institute of the National Economy]

[Abstract] Turkmenistan climate favors cultivation of microalgae and it is why such cultivation is practiced on a semicommercial scale. A plant for growing chlorella, for application in animal breeding and in pharmacology, was established at the laboratory of Heliobiologic Equipment of the Scientific Production Association "Solntse", TSSR Academy of Sciences together with the All Union Scientific Research Institute of Biotechnology. A special tubular cultivator was developed for maximum utilization of solar energy to provide heat, nutrients and carbon dioxide. Optimal concentration for production of chlorella was found to be in the range of 1 to 2 g/l; when the upper limit is reached, suspension is decanted and diluted to the lower level. A mathematical model was developed for this system to permit a theoretical approach to problem-solving using the Fergulst equation $\frac{dX}{dt} = \mu X - \beta X^2$ where μ and β are values determined experimentally. References 4 (Russian).

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